UPDATED

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP)

ORIGINAL INRMP IMPLEMENTATION PERIOD FISCAL YEAR (FY) 2002-2007
UPDATED INRMP IMPLEMENTATION BEGINNING FY 2015

AT THE

CAMP RAVENNA JOINT MILITARY TRAINING CENTER

PORTAGE AND TRUMBULL COUNTIES, OHIO

OHIO ARMY NATIONAL GUARD

AGOH FM EN
2825 W. DUBLIN GRANVILLE ROAD
COLUMBUS, OHIO 43235-2789

DECEMBER 2014

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PORTAGE AND TRUMBULL COUNTIES, OHIO
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This Integrated Natural Resources Management Plan (INRMP) is the second update of the original 2001 Ravenna Training and Logistics Site (RTLS) INRMP. The facility has been renamed Camp Ravenna Joint Military Training Center (CRJMTC; Camp Ravenna). The following document is the result of a review for operation and effect of the previous 2008 updated INRMP and a recommendation by the cooperating agencies to conduct another update and continue implementation. It meets the requirements for INRMPs as specified in the Sikes Act, as amended (16 USC §670a *et seq.*). It has set appropriate and adequate guidelines for conserving and protecting the natural resources of Camp Ravenna while facilitating and supporting the military mission.

Approving Officials:

Date: 24 Apr 15

WILLIAM M. MYER
COL, EN
Chief, Environmental Programs Division

Date: 11 Apr 15

MARK E. BARTMAN
MAJ GEN
The Adjutant General

Date: 7 APR 2015

JOHN P. DERNBERGER
COL NGB
United States Property and Fiscal Officer for Ohio

Date: 23 Mar 15

MICHAEL ORE
COL, OHARNG
Construction and Facilities Management Officer

Date: 7 APR 15

ROBERT C. BRAMLISH
COL, GS OHARNG
Deputy Chief of Staff for Operations

Date: 17 MAR 15

BARBARA A. HERRINGTON-CLEMENS
COL, OHARNG
Fort Ohio Commander

William E. Meade

Date: 26 Jan 2015

WILLIAM E. MEADE
LTC, OHARNG
Garrison Commander

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Approving Officials:

_____ Date:_____
WILLIAM M. MEYER
COL, EN
Chief, Environmental Programs Division

_____ Date:_____
MARK E. BARTMAN
MAJ GEN
The Adjutant General (Interim)

_____ Date:_____
JOHN P. DERNBERGER
COL NGB
United States Property and Fiscal Officer for Ohio

_____ Date:_____
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COL, OHARNG
Construction and Facilities Management Officer

_____ Date:_____
ROBERT C. BRAMLISH
COL, GS OHARNG
Deputy Chief of Staff for Operations

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COL, OHARNG
Fort Ohio Commander

_____ Date:_____
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LTC, OHARNG
Garrison Commander

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EXECUTIVE SUMMARY

The Integrated Natural Resources Plan (INRMP) is the primary guidance document and tool for managing natural resources at the Camp Ravenna Joint Military Training Center (CRJMTC; Camp Ravenna). Camp Ravenna must provide a variety of environmental conditions and ecosystems in which to train soldiers. This objective must be met in a way that provides for sustainable, healthy ecosystems, complies with applicable environmental laws and regulations, and provides for no net loss in the capability of military installation lands to support the military mission of the installation. INRMPs help installation commanders manage natural resources more effectively to ensure that installation lands remain available and in good condition to support the installation's military mission.

This INRMP is an update to the previously updated 2008 RTLS INRMP. Since issuance of the 2008 INRMP the facility has been renamed Camp Ravenna Joint Military Training Center and will no longer be referred to as the Ravenna Training and Logistics Site (RTLS). This INRMP has been developed for the planning period from fiscal year 2014 (FY14) through FY19, and is the result of a review for operation and effect done by the U.S. Fish and Wildlife Service (USFWS), the Ohio Department of Natural Resources (ODNR), and the Ohio Army National Guard (OHARNG). The review resulted in the desire of the cooperating agencies to update and to continue implementing the existing INRMP. The details of this review process are described in **Section 1.1** of the INRMP. No substantive changes were made to the management programs and philosophies or the goals, objectives, and implementation projects. The INRMP has been updated as follows.

- General clerical changes have been made throughout the INRMP to capture the change in name from the RTLS to CRJMTC.
- The text has been updated to reflect ongoing facilities upgrades and associated increases in military mission capability and the land use classification (improved, semi-improved, unimproved) acreages in Table 15 updated accordingly.
- Onsite wetland mitigation sites that must be managed and protected in perpetuity have been identified in the INRMP.
- The Vegetation Control Plan has been updated to reflect current practice associated with facilities upgrades.
- Changes to grassland management areas have been made to facilitate mission support needs and successional young forest habitat management areas have been identified and projects 5.3.4 and 5.3.5 added in Section 7 accordingly.
- The INRMP Implementation Analysis (**Appendix B**), used to document degree of INRMP implemetion, has been updated.
- Table 18 that lists specific implementation projects has been updated to show planned projects and projected funding needs out to FY19.
- GIS data has been generated and mapping updated.
- Natural resources data and species lists have been updated to include new data and to include changes in the status of rare species.
- The timber harvest and Timber Stand Improvement (TSI) schedules have been updated to continue the existing forest management program.
- The hunting regulation has been renumbered and updated to reflect current practice and the name change to CRJMTC.
- An Environmental Check List and Record of Environmental Consideration have been developed and included in **Appendix C**.

In conjunction with the INRMP update, planning level surveys (PLSs) for vascular plants, fauna, threatened and endangered species, wetlands, and surface waters were also updated to incorporate survey and inventory data collected over the previous 5-year INRMP implementation period

Camp Ravenna includes approximately 21,683 acres of federally-owned property with concurrent jurisdiction under the command of the OHARNG. The installation is located in Portage and Trumbull Counties in northeastern Ohio, approximately 35 miles southeast of Cleveland, 3 miles east of the City of Ravenna, 1 mile north-northwest of the City of Newton Falls, and approximately 15 miles west-southwest of the City of Warren. The primary purpose of Camp Ravenna is to support the military missions of the OHARNG. The INRMP is designed to support and accommodate accomplishment of the military missions by enabling sustained use of training lands in perpetuity through natural resources stewardship and management. Specific goals identified by the INRMP are:

GOAL 1: Manage natural resources in a manner that is compatible with and supports the military mission while complying with applicable Federal and State laws and Army regulations and policies.

GOAL 2: Maintain and foster positive working relationships with the U. S. Fish and Wildlife Service, the ODNR Division of Wildlife, and other federal, state and local natural resources management agencies and organizations for the benefit of the military mission, the natural resources being managed, and the citizens of Ohio and the nation.

GOAL 3: Monitor the condition of the natural resources and the implied impacts from training and the natural resources management program on the natural resources at Camp Ravenna.

GOAL 4: Protect and maintain populations of rare plant and animal species on Camp Ravenna in compliance with federal and state laws and regulations.

GOAL 5: Sustain usable training lands and native natural resources by managing non native and invasive species, vegetation and plant communities, and nuisance wildlife species.

GOAL 6: Manage wildlife resources in a manner compatible with the military mission and within the limits of the natural habitat.

GOAL 7: Manage the Camp Ravenna whitetail deer population in a manner that minimizes impacts on the military mission, is ecologically sustainable, provides for public hunting, and is in accordance with Army regulations and state law.

GOAL 8: Manage forest resources to the benefit of the military mission, to perpetuate the ecosystem functions, to support regional ecosystem needs, and for the production of forest products.

GOAL 9: Manage wetlands and other surface waters in accordance applicable Federal, State, and local regulations and to protect water quality and ecological function while facilitating the military mission.

GOAL 10: Manage soil to maintain productivity and prevent and repair erosion in accordance with state and federal laws and regulations so that Camp Ravenna can support doctrinally required military training in perpetuity.

GOAL 11: Manage cultural resources on Camp Ravenna in accordance with State and Federal laws and regulations while implementing the natural resources management program.

GOAL 12: Develop, maintain, and manage data regarding natural resources at Camp Ravenna through the use of Geographic Information System (GIS) for efficient data storage, retrieval, analysis, and presentation.

These goals are supported in the INRMP by objectives and projects, which provide management strategies and specific actions to achieve these goals. Goals and objectives are listed in **Section 7.0** of the INRMP, and projects are listed in Table 18 of Section 8.0.

These goals will ensure the success of the military mission and conservation of natural resources. The general philosophies and methodologies used throughout the Camp Ravenna natural resources management program are focused on conducting doctrinally required military training while maintaining ecosystem viability and sustainability.

This updated INRMP provides a description of the installation (e.g., location, history and mission), information regarding the on-site and adjacent physical and biotic environment, and specific natural resource management programs designed for successful and sustainable military training. Additionally, this INRMP presents methods that will increase the environmental awareness of OHARNG personnel, guest units using Camp Ravenna for training, and the general public. The implementation of this INRMP at Camp Ravenna will ensure the successful accomplishment of the OHARNG's military missions while promoting adaptive stewardship practices that sustain ecosystem and biological integrity and by providing for multiple uses of natural resources.

Existing cultural resources at Camp Ravenna are referenced within the context of established management protocols as a means of ensuring the compatibility of the INRMP and the cultural and historic resources included in the OHARNG's statewide Integrated Cultural Resource Management Plan (ICRMP).

An Environmental Assessment (EA) of the original 2001 RTLS INRMP was completed to fulfill the requirements of the National Environmental Policy Act (NEPA). The EA presented the *Preferred Alternative* (implementation of the INRMP) and other alternatives, summarized the affected environment, and assessed the environmental consequences of implementation. The EA concluded that implementation of the INRMP under the *Preferred Alternative* was expected to result in net positive effects by sustaining and enhancing the natural resources while providing for no let loss in training lands. A Finding of No Significant Impact (FNSI) was signed by NGB on 9 November 2001 and the RTLS INRMP was implemented.

The updated INRMP has been updated but there have been no substantive changes in the manner in which Camp Ravenna will manage the resources, therefore implementation will be a continuation of the *Preferred Alternative* identified in the EA for the 2001 and 2008 RTLS INRMPs. As such, the 2001 INRMP EA and the FNSI are valid for the updated INRMP and a new EA has not been conducted. An Environmental Checklist and a Record of Environmental Consideration (REC) citing the 2001 INRMP EA are included in **Appendix C**.

CONTENTS

FIGURES

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

AASF	Army Aviation Support Facility
ACHP	Advisory Council on Historic Preservation
AEC	Army Environmental Center
AEDB-EQ	Army Environmental Database Environmental Quality module
AERO	Army Environmental Reporting Online
AIRFA	American Indian Religious Freedom Act
AMATS	Akron Metro Area Transportation Study
AMSL	Above Mean Sea Level
AR	Army Regulation
ARNG	Army National Guard
ARPA	Archaeological Resources Protection Act
ASP	Ammunition Supply Point
BBS	Breeding Bird Survey
bgs	Below ground surface
BMP	Best Management Practice
BRAC	Base Realignment and Closure
CFR	Code of Federal Regulations
COL	Colonel
CRJMTC	Camp Ravenna Joint Military Training Center
CSMS	Combined Support Maintenance Shop
CTRE	Center for Transportation Research and Education
CWA	Clean Water Act
DA	Department of Army
DBH	Diameter at Breast Height
DCSOPS	Deputy Chief of Staff for Operations and Plans
DEM	Digital Elevation Model
DENIX	Defense Environmental Network Information Exchange
DFAO	Defense Finance and Accounting Office
DLG	Digital Line Graphics
DNAP	Division of Natural Areas and Preserves
DoD	Department of Defense
DoDI	Department of Defense Instruction
DOQQ	Digital Ortho Quarter Quad
DRG	Digital Raster Graphics
DUSD	Deputy Under Secretary of Defense
EA	Environmental Assessment
ECM	Earth Covered Magazine
EIS	Environmental Impact Statement
EMS	Environmental Management System
EO	Executive Order
EQR	Environmental Quality Report
EPRWeb	Environmental Program Requirements
ESA	Endangered Species Act
ES&OH	Environment, Safety & Occupational Health
°F	Fahrenheit
FEMA	Federal Emergency Management Agency
FGDC	Federal Geographic Data Committee
FM	Field Manual
FM-EN	Facilities Management Environmental Office
FMS	Field Maintenance Shop
FNSI	Finding of No Significant Impact
FY	Fiscal Year
GIS	Geographic Information System
HAZMAT	Hazardous Materials
HMWMP	Hazardous Materials Waste Management Plan
HUC	Hydrologic Unit Codes
HW	Hazardous Waste
ICP	Integrated Contingency Plan
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IPMP	Integrated Pest Management Plan
IRP	Installation Restoration Program
ISO	International Standards Organization
ITAM	Integrated Training Area Management
LRAM	Land Rehabilitation and Maintenance
LWSC	Low Water Stream Crossing
METL	Mission Essential Task List
MILES	Multiple Integrated Laser Engagement System
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MP	Military Police
NAGPRA	Native American Graves Protection and Repatriation Act
NAWMP	North American Waterfowl Management Plan
NEPA	National Environmental Policy Act of 1969
NGB	National Guard Bureau
NGB-ARI	NGB Army Installations Division
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NoI	Notice of Intent
NPS	National Park Service

NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OAC	Ohio Administrative Code
ODCSOPS	Office of the Deputy Chief of Staff for Operations
ODF	Ohio Division of Forestry
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
ODOW	Ohio Division of Wildlife
OEPA	Ohio Environmental Protection Agency
OFA	Ohio Forestry Association
OHARNG	Ohio Army National Guard
OHPO	Ohio Historic Preservation Office
OSAF	Ohio Society of American Foresters
ORC	Ohio Revised Code
P2	Pollution Prevention
PCB	Polychlorinated Biphenyl
PEM	Palustrine Emergent
PFO	Palustrine Forested
PLS	Planning Level Surveys
PMC	Pest Management Coordinator
PSS	Palustrine Scrub-shrub
QHEI	Quality Habitat Evaluation Index
REC	Record of Environmental Consideration
ROA	Report of Availability
RTLA	Range and Training Land Analysis
RTLP	Range and Training Land Program
RTLS	Ravenna Training and Logistics Site
RVAAP	Ravenna Army Ammunition Plant
SAIA	Sikes Act Improvement Act
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
SPCC	Spill Prevention Contingency and Control
SR	State Route
SRA	Sustainable Range Awareness
SRM	Sustainment Restoration & Maintenance
SRP	Sustainable Range Program
SSURGO	Soil Survey Geographic Database
STEP	Status Tool for the Environmental Program
SWMU	Solid Waste Management Unit
SWPP	Storm Water Pollution Prevention
TA	Training Area
T & E	Threatened and Endangered
TNC	The Nature Conservatory
TNT	Trinitrotoluene
TRI	Training Requirement Integration
TSC	Training site Commander
TSI	Timber Stand Improvements
TVMA	Tactical Vehicle Maneuver Area
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USDHUD	U.S. Department of Housing and Urban Development
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
USP&FO	United States Property and Fiscal Office
UTES	Unit Training Equipment site
VE	Volunteer Escort
WAU	Water Assessment Units
WQC	Water Quality Certification
WWH	Warm Water Habitat

SECTION 1: GENERAL INFORMATION

1.1 PURPOSE

The Integrated Natural Resources Plan (INRMP) is the primary guidance document and tool for managing natural resources at the Camp Ravenna Joint Military Training Center (CRJMTC; Camp Ravenna); formerly known as the Ravenna Training and Logistics Site (RTLS). Camp Ravenna must provide a variety of environmental conditions and ecosystems in which to train soldiers. This objective must be met in a way that provides for sustainable, healthy ecosystems, complies with applicable environmental laws and regulations, and provides for no net loss in the capability of military installation lands to support the military mission of the installation. INRMPs help installation commanders manage natural resources more effectively to ensure that installation lands remain available and in good condition to support the installation's military mission.

Department of Defense (DoD) Manual 4715.03, *Integrated Natural Resources Management Plan (INRMP) Implementation Manual*, 25 November 2013, provides procedures to prepare, review, update, and implement INRMP's in compliance with the Sikes Act. This manual replaces the DoD Office of the Deputy Undersecretary of Defense (DUSD), Supplemental Guidance concerning INRMP reviews, dated 1 November 2004. Identified in this guidance are general INRMP provisions including the requirement for each installation to conduct Planning Level Surveys (PLSs) as the foundation for effective planning and decision making. INRMPs are required to be jointly reviewed by the United States Fish and Wildlife Service (USFWS), State conservation agency, and military proponent for operation and effect on a regular basis, but not less often than every five years. During the updating process, Enclosure 3 of manual gives each installation the ability to make INRMPs available electronically to partner agencies to expedite review and comment process. DoD Manual 4715.03 provides guidance on entering into cooperative agreements for management with governmental organizations as well as private individuals. Also included in this is DoD policy on wildland fire management which calls for the installation's Integrated Wildland Fire Management Plan (IWFMP) to be incorporated into the INRMP. DoD Manual 4715.03 differs from previous guidance in that it also calls for each installation to do what they can to address and mitigate the potential impacts of climate change. Furthermore, each installation is directed to include a discussion in the context of climate change in the INRMP and identify such potential impacts in the implementation table so that funding for projects designed to thwart climate change may be granted.

Department of the Army (DA), Memorandum, DAIM-ED, 25 May 2006 provides guidance on how the Army implements the Sikes Act Improvement Act (SAIA). This guidance addresses what an INRMP is, its purpose, who prepares it, the criteria for determining which installations require an INRMP, coordination requirements, reporting requirements, review requirements, Endangered Species Act (ESA) consultation requirements, public access policies, the requirement for no net loss of capability to support military training, and a few other topics. This is a general guidance document on the purpose, development, implementation, and update / revision of INRMPs. It requires INRMPs to be developed jointly with the USFWS and State conservation agency. It requires INRMPs to support the military mission and details the review process with emphasis on joint annual reviews and review for operation and effect no less than every five years. The guidance also indicates that the review for operation and effect will determine if a revision is required. A revision is not required if the cooperating agencies agree that an INRMP is meeting the intent of the Sikes Act. Instead, the INRMP can be updated as necessary and implementation continued.

Army National Guard Directorate, Environmental Programs Division (ARNG-ILE) Guidance for the Creation, Implementation, Review, and Revision and Update of Integrated Natural Resources Management Plans (INRMPs), 9 April 2012. This guidance outlines the development, coordination, and the DoD format criteria of an initial INRMP for all military installations with significant natural resources. This guidance also provides the procedure and requirements of updating or revising an existing INRMP. Implementation of an INRMP includes annual coordination with all cooperating

offices, sufficient staff to carry out INRMP tasks, and the documentation of action accomplishments and effectiveness of management and future actions. An INRMP review is conducted by the OHARNG annually. The USFWS and State agency are invited to participate in the annual review but are not required to participate. Reviews for Operation and Effect are conducted by the OHARNG, USFWS and State agency a minimum of every five year. An INRMP may be updated if changes are minimal and do not result in biophysical changes different from those stated in the original INRMP. These updates may be initiated during the annual review and must include the anticipated project plan for a minimum of five years. Substantial revisions resulting in biophysical consequences that must be made to the original INRMP can be developed at the States discretion with mutual agreement of the USFWS. Revised and initial INRMP require a public comment period.

This INRMP is an update to the previously updated 2008 Ravenna Training and Logistics Site (RTLS) INRMP (planning period from fiscal year (FY) 2008 through 2012) and is the result of a review for operation and effect done by the USFWS, the Ohio Department of Natural Resources (ODNR), and the OHARNG. Both the OHARNG environmental office and military trainers where included in the review. The three cooperating agencies have actually been reviewing the plan for operation and effect since implementation on an ongoing basis by means of an annual meeting held at Camp Ravenna where military mission alignment and requirements, prior year INRMP implementation, and current year programs and projects are discussed. In addition to formal meetings and information requests, the OHARNG has an open door policy with partnering agencies and they are invited on a field visit after annual meetings if they desire. The OHARNG and the ODNR work together on wildlife related public access programs and as such the ODNR Division of Wildlife (DOW) personnel are in regular communication with the OHARNG and are on site throughout the year doing wildlife surveys, nest box cleaning, waterfowl banding, and deer checking. The USFWS has not expressed a desire for regular site visits and usually are only on site during the annual meeting or if specifically requested by the OHARNG.

Discussions in the annual meetings and information gathered in the Review for Operation and Effect held on 19 December 2012 was reviewed as part of the update process. The minutes from the 19 December 2012 Review for Operation and Effect, written responses from ARNG, and written responses from the USFWS, the ODNR, and the ODNR DOW along with the OHARNG response to comments are given in **Appendix A**. The annual meeting agendas and minutes are on file at Camp Ravenna. The review of the 2008 RTLS INRMP for operation and effect resulted in the desire of the cooperating agencies to update and to continue implementing the existing INRMP.

Based on the desire to update the INRMP, the OHARNG took on the task to update the plan in accordance with the Army National Guard (ARNG) 9 April 2012 INRMP guidance and to incorporate updated natural resources data. The INRMP has been updated as follows.

- General clerical changes have been made throughout the INRMP to capture the change in name from the RTLS to CRJMTC.
- The text has been updated to reflect ongoing facilities upgrades and associated increases in military mission capability and the land use classification (improved, semi-improved, unimproved) acreages in Table 16 updated accordingly.
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In conjunction with the INRMP update, planning level surveys (PLSs) for vascular plants, fauna, threatened and endangered species, wetlands, and surface waters were also updated to incorporate survey and inventory data collected over the previous 5-year INRMP implementation period

1.2 AUTHORITY

This INRMP has been prepared pursuant to the following laws, regulations, and directives:

- The Sikes Act "Conservation Programs on Military Reservations" (16 United States Code [USC] §670a *et seq.*), as amended - Requires Federal military installations with significant natural resources to develop long-range integrated natural resources management plans and implement cooperative agreements with other agencies. Natural resources are to be managed for multipurpose uses and provide the public access to those uses to the extent consistent with the military mission. The act also sets guidelines for the collection of fees for the use of natural resources such as hunting and fishing.
- Department of Defense (DoD) Manual 4715.03, Integrated Natural Resources Management Plan (INRMP) Implementation Manual, 25 November 2013;
- Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*, 18 March 2011;
- US Army policy entitled Army Goals and Implementing Guidance for Natural Resources PLS and INRMP ("Army INRMP Policy"), 21 March 1997;
- AR 200-1, Environmental Protection and Enhancement;
- 32 Code of Federal Regulations (CFR) 651, *Environmental Effects of Army Actions*;
- DoD Directive 4700.4, Natural Resources Management Program, 24 January 1989;
- Memorandum, DAIM-ED, Guidance for Implementation of the *SAIA,* 25 May 2006;
- 32 CFR 190, Appendix-Integrated Natural Resources Management;
- Department of Defense Memorandum, Integrated Natural Resource Management Plan (INRMP) Template, 14 August 2006;
- Army National Guard Directorate, Environmental Programs Division (ARNG-ILE) Guidance for the Creation, Implementation, Review, and Revision and Update of Integrated Natural Resources Management Plans (INRMPs), 9 April 2012; and
- MOU between the US DoD, the USFWS, and the Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resources Management Program on Military Installations, signed 29 July 2013 and subsequent promulgated guidance.

1.3 RESPONSIBILITIES

The Adjutant General, Ohio National Guard is directly responsible for the operation and maintenance of OHARNG facilities, including implementation of this INRMP. Under the direction of the Adjutant General, the force structure (types and number of units, types of equipment, training events, etc.), projects, construction and budgets at OHARNG facilities are determined throughout the 5-year operational period of the INRMP. Under the leadership of the Adjutant General, all OHARNG personnel and guests are trained in environmental awareness, and as such are explicitly mandated to comply with the policies, procedures, requirements and applicable laws and regulations that accomplish the goals and objectives of the INRMP.

The OHARNG Deputy Chief of Staff for Operations (DCSOPS) has the primary responsibility for military training of OHARNG troops and for ensuring the safety of personnel during the conduct of training exercises at OHARNG facilities. The DCSOPS determines the training capacity based upon the force structure determined by the Adjutant General. The DSCOPS is responsible to insure that the INRMP supports OHARNG training requirements. The DCSOPS office reviews the plan and is a signatory to the plan.

The OHARNG Environmental Office (NGOH-IMR-ENV) works for the Construction and Facilities Management Officer (CFMO) in the Directorate of Installations Management and Resources (DIMR) and is responsible for environmental program management for the OHARNG. The NGOH-IMR-ENV staff at Camp Ravenna is responsible for managing the conservation program throughout Ohio and for developing and implementing the Ravenna INRMP. NGOH-IMR-ENV provides technical assistance to the Training Site Commander (TSC) and training site personnel for successful and environmentally sustainable implementation of military missions and training site operations and development. NGOH-IMR-ENV develops reimbursable program annual work plans and conservation budget requests, develops conservation projects, secures required permits, conducts field studies, provides environmental awareness materials, identifies natural and cultural resources, directs the National Environmental Policy Act (NEPA) process, and manages the development, revision, and implementation of the INRMP. NGOH-IMR-ENV is also responsible for the annual review of the INRMP. Periodic evaluations and Reviews for Operation and Effect at no less than every five years are conducted by NGOH-IMR-ENV with input from the United States Fish and Wildlife Service (USFWS), the Ohio Department of Natural Resources (ODNR), and other government agencies and internal and external stakeholders, as appropriate.

The ARNG is responsible for review and approval of this INRMP. The ARNG is also involved in programming, funding, and reviewing implementation projects set forth in the INRMP.

The USFWS provides technical assistance to Camp Ravenna and is a cooperator during preparation of this Plan per the Sikes Act (16 USC 671a et seq.). Specifically, the USFWS is the principal advisor to Camp Ravenna on issues regarding federally protected rare, threatened and endangered species.

The ODNR provides guidance to Camp Ravenna on State listed species and habitats of special concern, and cooperates in the management of public access programs. The ODNR and the ODNR DOW are also cooperators during preparation of this Plan per the Sikes Act (16 USC 671a et seq.).

1.4 LEGISLATIVE JURISDICTION

Concurrent Legislative jurisdiction exists over Camp Ravenna. Both Federal and State law enforcement officials have jurisdiction at the training site for the prosecution of criminal offenses. The penal laws of the State of Ohio are enforceable by Ohio law enforcement officials. Certain State game law violations committed on the Camp Ravenna property may also be Federal offenses under 10 USC 267(c). Concurrent jurisdiction does not make state laws any more or less applicable on Camp Ravenna. It does give state law enforcement agencies the ability to make arrests and prosecute criminal offenses, where previous to concurrent jurisidiction only federal law enforcement and courts could execise this authority.

1.5 MANAGEMENT PHILOSOPHY

This updated INRMP has been developed in cooperation with the USFWS and ODNR using an interdisciplinary approach. Information has been gathered from various OHARNG directorates, the Camp Ravenna staff, as well as other Federal, State and local agencies and special interest groups with an interest in the management of natural resources at Camp Ravenna. Agencies and organizations consulted during the development of this INRMP, as well as initial agency and tribal coordination and response letters, have been included in **Appendix A**.

Enabling long-term use of Camp Ravenna for military training is the primary purpose of natural resources management at Camp Ravenna. The Camp Ravenna INRMP is a training-driven plan, created with a dual goal:

- To allow for and support the conduct of military training at levels necessary to maintain a full readiness posture for national defense and civil missions; and
- To provide for management of natural resources in an ecosystem-oriented, sustainable manner, consistent with federal, state, and local regulations.

The OHARNG embraces the concept of integrating, holistic and adaptive natural resource management that facilitates and supports mission activities. The OHARNG recognizes that on-going military training and associated mission activities can consume and potentially damage the natural resources on mission land, and that successful execution of their mission in perpetuity is dependent upon sustainable land use and the conservation of these natural resources. The OHARNG is committed to the planned, deliberate and adaptive management of natural resources, supporting the installation operational mission, meeting or exceeding stewardship requirements, partnering in local and regional conservation initiatives, and enhancing the quality of life for its personnel and guests.

The OHARNG recognizes that it is a steward of publicly-owned natural resources and, as compatible with the military mission and Camp Ravenna safety and security requirements, that it has a responsibility to provide access for the use and enjoyment of these resources in a manner consistent with the resources' ability to support such use. The OHARNG also recognizes the responsibility to ensure that the natural and cultural resources entrusted to their care are sustained in a healthy condition for scientific research, education and other compatible uses by future generations.

The overall policies and philosophy of land management at Camp Ravenna are derived from AR 200-1, 32 CFR 651, and DODI 4715.03 These policies, regulations and programs are based on the concept that adaptive natural resources management is an integral component of the primary mission of military training. The OHARNG must train; therefore, the OHARNG will manage Camp Ravenna to conserve valuable training resources, including the natural environment. Adaptive management of natural resources on an ecosystem basis ensures the sustainable use of training lands while considering the effects on the surrounding environment and public concern.

1.5.1 MILITARY MISSION

The primary purpose of natural resources management at Camp Ravenna is to support the military training mission. With regard to accomplishment of the military mission, the overall goal is to maintain and add to *sustainable natural resources as a critical training asset* upon which to accomplish the mission of the OHARNG at Camp Ravenna. Components of this overall goal include:

- Ensure no net loss in the capability of installation lands to support existing and projected military training and operations at Camp Ravenna; and
- Maintain quality training lands through proactive management, range and training land monitoring and damage minimization, mitigation, and rehabilitation.

This INRMP integrates aspects of natural resources management into the military mission. As such, it becomes the primary tool for ecosystem management at Camp Ravenna while ensuring the successful, efficient accomplishment of the military mission. A multiple-use ecosystem management approach will

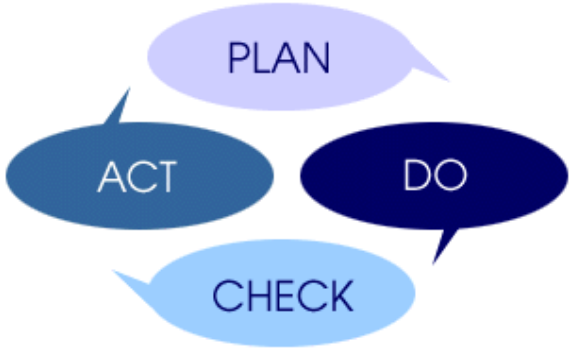
be implemented to accommodate mission-oriented activities and provide for good stewardship, thereby maintaining and improving the quality, aesthetic values and ecological relationships of the environment.

Specific military missions and training requirements are fluid and change from time to time with realignments, transformations, and changes in equipment and tactics. This requires the establishment of basic underlying natural resource management principles and practices that have broad application and can be adapted in multiple situations, such as is the case with surface water and soil management practices. Implementation of this INRMP at Camp Ravenna will successfully promote adaptive stewardship practices that protect and enhance natural resources for multiple use, sustainable yield and biological integrity, while supporting the military mission.

1.5.2 ENVIRONMENTAL MANAGEMENT SYSTEM

This INRMP directly supports the OHARNG's and the NGB's Environmental Management System (EMS). Executive Order (EO) 13148 "Greening the Government through Leadership in Environmental Management" was signed in April 2000 and established a five-year EMS implementation goal for federal facilities. Developing and implementing an EMS is required at all Army installations, as well as at all ARNG installations. For the purpose of complying with the EO 13148 the OHARNG as a whole is considered to be a federal installation. The OHARNG has developed and is implementing an EMS that covers all its operations, facilities, and training sites. The EMS is part of the overall OHARNG management system and includes organizational structure, planning, responsibilities, practices, procedures and processes, and resource allocation for developing, implementing, achieving, reviewing, and maintaining environmental commitments. The International Standards Organization (ISO)-14001 EMS model used by the OHARNG leads to continual improvement based upon a cycle of "plan, do, check, act":

- Planning, including identifying environmental aspects and establishing goals [plan];
- Implementing, including training and operational controls [do];
- Checking, including monitoring and corrective action [check];
- Reviewing, including progress reviews and acting to make needed changes to the EMS [act].



Source: USEPA, 2004

The EMS is continually updated through this cycle, fine-tuning its management of operations that may harm the environment. This continual improvement cycle is a fundamental attribute of the EMS that allows the system to adapt to the dynamic nature of the organization's operations.

This INRMP directly supports the OHARNG's and the NGB's EMS. Baseline data on natural resources has been collected. Training site development plans and military training activities have been planned and implemented that have the potential to impact natural resources. Natural resource projects have also been planned and implemented to proactively manage the natural resources and support military operations. The condition of the natural resources is then monitored via biological inventories and surveys at regular intervals of one, five, or 10 years depending upon the resource to determine if the military mission is creating an impact and if natural resources management actions are having desired effects. Adjustments in management are made based on these inventories and surveys. In addition, annual reviews of the INRMP, in conjunction with the USFWS and the ODNR, are conducted to evaluate and adjust implementation on a year to year basis. Annual reviews are discussed in **Section 8.3** and monitoring of implementation is discussed in **Section 8.4.**

1.5.3 ECOSYSTEM MANAGEMENT

An ecosystem is the "sum of the plant community, animal community, and environment in a particular region or habitat" (Barbour et al., 1987). Ecosystem management may be defined as management "to restore and maintain the health, sustainability, and biological diversity of ecosystems while supporting sustainable economies and communities" (U.S. Environmental Protection Agency [USEPA], 1994).

The goal of ecosystem management at Camp Ravenna is to ensure that the land and associated natural resources can support present and future training and military land use requirements while retaining, and where possible improving and enhancing, ecosystem integrity and biological diversity. Natural resources at Camp Ravenna will be managed with an ecosystem management approach.

Principles and guidelines of ecosystem management are as follows:

1) Provide continued access to land, air and water for realistic military training;
2) Maintain and improve the sustainability of native biodiversity of ecosystems;
3) Avoid single-species management and implement an ecosystem-based multiple species management approach, insofar as that is consistent with the requirements of the ESA;
4) Administer with consideration of ecological units and timeframes and foster long-term sustainability of ecosystem services;
5) Support sustainable human activities;
6) Develop vision of ecosystem health;
7) Develop priorities and reconcile conflicts;
8) Develop coordinated approaches to work toward ecosystem health;
9) Evaluate and engage in local and regional management initiatives and partnerships that benefit the goals and objectives of the INRMP;
10) Rely on the best science and data available;
11) Use benchmarks to monitor and evaluate outcomes;
12) Use adaptive management; and
13) Implement through installation plans and programs.

Biological diversity or biodiversity may be defined as "the variety of living organisms considered at all levels of organization, from genetics through species, to higher taxonomic levels, and including the variety of habitats and ecosystems, as well as the processes occurring therein" (Meffe and Carrol, 1994).

Biodiversity refers to the variety and variability among living organisms and the environment in which they occur. Biodiversity has meaning at various levels including ecosystem diversity, species diversity, and genetic diversity. The DoD has developed a Biodiversity Management Strategy (Keystone Center, 1996). This document identifies five reasons to conserve biodiversity on military lands:

1) Sustain natural landscapes required for the training and testing necessary to maintain military readiness;
2) Provide the greatest return on the DoD investment to conserve and protect the environment;
3) Expedite the compliance process and help avoid conflicts;
4) Engender public support for the military mission; and
5) Improve the quality of life for military personnel.

The Keystone Center report notes that the challenge is "to manage for biodiversity in a way that supports the military mission". This strategy identifies the INRMP as the primary vehicle to implement biodiversity conservation on military installations. The model process developed within the strategy includes the following principles:

- Support the military mission;
- Use joint planning between natural resources managers and military operations personnel;
- Integrate biodiversity conservation into the INRMP and other planning protocols;
- Involve internal and external stakeholders up front;
- Emphasize the regional (ecosystem) context; and
- Concentrate on results.

DoD Instruction 4715.03 states that biodiversity conservation on DoD lands and waters should be followed whenever practicable to:

1) Maintain or restore remaining native ecosystem types across their natural range of variation;
2) Maintain or reestablish viable populations of native species on an installation, when practical; and
3) Maintain ecological processes, such as disturbance regimes, hydrological processes, and nutrient cycles, to the extent practical;

DoD Instruction 4715.03 further states that:

1) DoD shall, to the best of its ability, implement conservation and management efforts to further the conservation of State-listed species when such action is practicable and does not conflict with legal authority, military mission, or operational capabilities;
2) DoD shall identifiy, prioritize, monitor, and control invasive and noxious species and feral animals on its installations whenever feasible (accordingly, native species should be used, where feasible, to restore any habitats from which non-native species are removed or controlled); and
3) DoD shall restore or rehabilitate altered or degraded landscapes and associated habitats to promote native ecosystems and land sustainability when such action is practicable and does not conflict with military mission or capabilities consistent with E.O. 13514.

DoD Manual 4715.03 addresses many of the same items in DoDI 4715.03 with the addition of guidance on addressing climate change. Regarding Climate Change, DoD Manual 4715.03 states each installation shall:

1) Conduct a vulnerability assessment of natural resources of interest and how those vulnerabilities may impact the mission of the installation.
2) Develop common regional goals in cooperation with partner agencies.
3) Cooperate with regional conservation partnerships and alliances to share information and callaborate across jurisdictions.

Specific management practices identified in this INRMP have been developed to enhance and maintain biological diversity within the ecosystems at Camp Ravenna. Chapter 6 identifies the specific natural resources management programs. Details on ecosystem management strategies are given in applicable program descriptions. Specifc monitoring is done for some programs such as deer herd management, nuisance beaver management, erosion control, and forest management. General ecosystem and species diversity monitoring is done for the entire Camp Ravenna facility

and activites at Camp Ravenna on one, five, or 10 year intervals via annual breeding bird surveys and various biological surveys.

1.5.4 SUSTAINABLE RANGE PROGRAM

The SRP is the Army's overall approach for improving the way in which it designs, manages, and uses its ranges to ensure long-term sustainability. Requirements for the SRP are set forth in AR 350-19, *Army Sustainable Range Program*, effective August 2005. SRP is defined by its two core programs, the Range and Training Land Program (RTLP) and the ITAM Program, which focus on the doctrinal capability of the Army's ranges and training land. To ensure the accessibility and availability of Army ranges and training land, the SRP core programs are integrated with the facilities management, environmental management, munitions management, and safety program functions supporting the doctrinal capability.

1.5.4.1 RANGE AND TRAINING LAND PROGRAM

The RTLP provides a range operations and modernization capability for the central management and prioritization and the planning and programming of live-fire training ranges and maneuver training lands, including the design and construction activities associated with them.

The RTLP planning process integrates mission support, environmental stewardship, and economic feasibility and defines procedures for determining range projects and training land requirements to support live-fire and maneuver training. The RTLP defines the quality assurance and inspection milestones for range development projects and the standard operating procedures (SOP) to safely operate military training, recreational, or approved civilian ranges under Army control and support Commanders' Mission Essential Task List, (METL) and Army training strategies. RTLP also establishes the procedures and means by which the Army range infrastructure is managed and maintained on a daily basis in support of the training mission.

1.5.4.2 INTEGRATED TRAINING AREA MANAGEMENT

The ITAM program provides Army range managers with the capabilities to manage and maintain training and testing lands by integrating mission requirements derived from the RTLP with environmental requirements and environmental management practices. Army ITAM program objectives are:

- Optimize sustained use of lands for the execution of realistic training and testing by providing a sustainable core capability that balances usage, condition, and level of maintenance.
- Implement a management and decision-making process that integrates Army training and other mission requirements for land use with sound natural resources management.
- Advocate proactive conservation and land management practices by aligning Army training land management priorities with Army training and readiness priorities (DA, 2005).

The OHARNG's ITAM program is administered through the DCSOPS as a Fort Ohio program, with all eligible sites included. Fort Ohio is comprised of Camp Ravenna, Camp Perry, Camp Sherman, and Tarlton Training Site. No OHARNG training sites, including Camp Ravenna, have individual programs. Camp Ravenna is an ITAM-eligible site.

The ITAM program is comprised of four proactive subprograms designed to facilitate these processes:

1) Range and Training Land Analysis (RTLA) is the ecological monitoring component that serves to characterize and monitor installation natural resources;

2) Training Requirements Integration (TRI) uses information generated and assimilated from RTLA to assist with military exercise scheduling and logistics so as to minimize harmful practices or activities within given Training Areas (TAs);

3) Land Rehabilitation and Maintenance (LRAM) provides mitigation measures and land rehabilitation where needed or desired; and

4) Sustainable Range Awareness (SRA) activities serve to promote awareness of environmentally sensitive issues and to foster a stewardship ethic among unit commanders, ground troops, neighboring communities, and other concerned or involved parties.

1.5.5 PUBLIC ACCESS

Controlled public access is permitted for purposes of implementing this plan. Safety and security requirements associated with military training activity, munitions storage, demolition activity, environmental restoration activity, land use controls associated with environmental remediation, and limited Camp Ravenna staff to oversee and manage access result in the need for access restrictions. Access is permitted only when compatible with the military mission and in accordance with Camp Ravenna safety and security requirements. Uncontrolled or open public access is not permitted. Access will be granted for:

- The harvest of timber products, hunting, fishing, and trapping, and other purposes in accordance with programs identified in this plan;
- Hosted special events and educational tours for small groups and students;
- Various biologists and natural resource professionals who are conducting research or biological inventories; and
- U.S. Forest Service (USFS), USFWS, ODNR, and other personnel from environmental and conservation agencies and organizations.

The TSC may at any time deny, revoke, or suspend access privileges or modify access requirements to facilitate mission needs and to ensure the safety and security of the public and/or government property.

1.6 CONDITIONS FOR IMPLEMENTATION, REVIEW, UPDATE AND REVISION

1.6.1 IMPLEMENTATION

The OHARNG FM-EN is responsible for directing the management of natural resources and for the development and implementation of the INRMP. Successful implementation of the INRMP will require:

- Administrative and technical support;
- Agency cooperation and technical assistance;
- Funding;
- Priorities and scheduling;
- Production of project scopes and budgets; and
- The ability to amend and revise this document as necessary.

Where projects identified in the plan are not implemented because of lack of funding, or other compelling circumstances, the OHARNG will review the goals and objectives of this INRMP to determine whether adjustments are necessary.

1.6.2 INRMP EFFECTIVENESS

The primary measure of INRMP effectiveness is whether it helps prevent "net loss in the capability of military lands to support the military mission". The OHARNG is maintaining Camp Ravenna's capability to support training through the natural resource management practices outlined in the INRMP. The

OHARNG works with several partners to manage the forest, preserve sensitive areas, and practice effective soil conservation. These activities are coordinated through ongoing INRMP implementation.

Long-term management effectiveness is also evaluated through periodic inventories of species populations, habitat quantity and quality, and habitat values through the recurring PLSs. Trends can be used to indicate the degree of success and to determine if management activities need modified. The OHARNG will evaluate these recurring data as they become available.

A practical evaluation of INRMP implementation includes reviewing whether planned projects have been accomplished. Overall, Camp Ravenna has benefited from using the INRMP as a management tool. The goals and objectives articulated in the INRMP are being addressed through implementation of management actions and projects recommended in the INRMP. Many of the specific management actions are implemented through projects. A large number of the projects are recurring actions that are continued in each INRMP update. **Appendix B** contains a list of goals, objectives, and projects from the previous INRMP, and their implementation status.

1.6.3 REVIEWS, UPDATES AND REVISIONS

The SAIA requires a review for operation and effect on a regular basis but no less than every five years to keep the INRMP current. Major changes require a revision of the INRMP, while minor changes can be incorporated with an update to the existing INRMP. A revision or update will be used based on the review for operation and effect conducted jointly with the USFWS and the ODNR.

On an annual basis the OHARNG, the USFWS and the ODNR will meet to review the INRMP and discuss implementation of upcoming programs and projects. At this annual meeting the need for updates or revisions will be discussed. If minor updates are needed, the requesting party will initiate the updates and after agreement of all three parties they will be added to the INRMP. If it is determined that major changes are needed, all three parties will provide input and an INRMP revision and associated NEPA review will be initiated with the OHARNG acting as the lead coordinating agency.

If not already determined in previous annual meetings, a determination will be jointly made to continue implementation of the existing INRMP with minor updates or to proceed with a revision by the forth year annual review. If the parties feel that the annual reviews have not been sufficient to evaluate operation and effect and they cannot determine if the INRMP implementation should continue or it should be revised, a formal review for operation and effect will be initiated. The determination on how to proceed with INRMP implementation or revision will be made after the parties have had time to complete this review.

Section 1.5.2 describes how the EMS of Plan, Do, Check, and Act is tied into INRMP reviews and updates / revisions. **Section 8.3** provides specific guidance on the INRMP review process including review for operation and effect and annual reviews.

1.6.4 NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE

An EA of the 2001 RTLS INRMP was completed to fulfill the requirements of the NEPA. The EA presented the *Preferred Alternative* (implementation of the INRMP) and other alternatives, summarized the affected environment, and assessed the environmental consequences of implementation. The EA concluded that implementation of the INRMP under the *Preferred Alternative* was expected to result in net positive effects by sustaining and enhancing the natural resources while providing for no let loss in training lands. A Finding of No Significant Impact (FNSI) was signed by NGB and the 2001 RTLS INRMP was implemented.

As discussed in **Section 1.1**, the INRMP has been reviewed by the USFWS, ODNR, and the OHARNG as to operation and effect. All parties agree that the updated INRMP is a continuation of the 2001 INRMP. There are no military mission changes, no program or management philosophy changes, and no input received from the USFWS or ODNR that resulted in changes to the way natural resources are managed at Camp Ravenna. The implementation projects identified in **Table 18** are continuations of ongoing projects with one newly identified project needed to continue implementation of an existing program.

The updated INRMP has been reorganized in accordance with the ARNG INRMP Template but there have been no substantive changes to the content and implementation will be a continuation of the *Preferred Alternative* identified in the EA for the 2001 RTLS INRMP. As such, the 2001 INRMP EA and the FNSI are valid for the updated INRMP and a new NEPA analysis is not necessary.

An Environmental Checklist and a REC have been included as **Appendix C**. The Environmental Checklist describes the Proposed Action (update and continued implementation of the 2001 RTLS INRMP), identifies that the updated INRMP is addressed in the 2001 RTLS INRMP EA, identifies potential impacts to various environmental media and concludes that a REC is the appropriate level of NEPA documentation. The REC that goes along with the Environmental Checklist cites the EA for the 2001 RTLS INRMP as adequately covering the updated INRMP. A copy of the FNSI from the 2001 RTLS INRMP EA is also included in **Appendix C**.

SECTION 2: INSTALLATION OVERVIEW

2.1 LOCATION AND AREA

Camp Ravenna is located in east-central Portage and southwestern Trumbull Counties, in northeastern Ohio. Trumbull County is bordered to the east by the Pennsylvania state line. The facility is located approximately 56 kilometers (35 miles) southeast of Cleveland, 4.8 kilometers (3 miles) east-northeast of the City of Ravenna, 24 kilometers (15 miles) west-southwest of the City of Warren, and 1.6 kilometers (1 mile) northwest of the City of Newton Falls (see **Figure 1**).

A total of 21,683 acres of property is managed under this INRMP. Of this total acreage, 20,279 acres or 93.5% are in Portage County (parts of Charlestown, Freedom, Paris, and Windham Townships) and 1,404 acres or 6.5% are in Trumbull County (part of Braceville Township).

The 2001 RTLS INRMP identified the total managed acreage as 21,419 acres. This was the acreage for the former RVAAP as recorded in the RVAAP property records. The OHARNG completed a boundary survey of the property in 2003 and the total acreage was found to be 21,683 acres. This is why there is a discrepancy between the plans. The acreage from the 2003 survey will be used in this and future INRMP revisions.

Camp Ravenna is approximately 17.7 kilometers (11 miles) long and 5.6 kilometers (3.5 Miles) wide. The facility is bound by State Route 5 (SR 5), the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garrett, McCormick, and Berry Roads on the west; the Norfolk Southern Railroad on the north; and SR 534 on the east. Interstate 80 is located less than one mile from the northern and eastern boundaries of the installation. Primary access to the Camp Ravenna property is provided by SR 5 and SR 534 (**Figure 2**).

Camp Ravenna is surrounded by several communities: Windham on the north, Garrettsville 9.6 kilometers (6 miles) to the northwest; Newton Falls 1.6 kilometers (1 mile) to the southeast; Charlestown to the southwest, and Wayland 4.8 kilometers (3 miles) to the south.

Several watercourses traverse the site, some of which drain into the Michael J. Kirwan Reservoir. The reservoir and dam are owned and operated by the U.S. Army Corps of Engineers (USACE). The West Branch State Park, which surrounds the reservoir, is federal land licensed to the State of Ohio and is managed by the ODNR.

2.2 INSTALLATION HISTORY

2.2.1 HISTORY OF OWNERSHIP AND USAGE

The War Department of the Roosevelt Administration purchased this property in 1939 and 1940 from many individual landowners. In 1940, construction began on separate production and storage areas, the Ravenna Ordnance Plant and the Portage Ordnance Depot, respectively. Construction was completed in 1942, and the production, storage and transfer of a variety of munitions manufactured for the war effort in Europe began. One year after the completion of construction, the separate production and storage areas were combined, and renamed the Ravenna Ordnance Center. In 1945, the facility was again renamed the RVAAP. The RVAAP was owned by the Federal government, but contractually operated by the Atlas Powder Company. This contractual arrangement lasted until the end of World War II, at which time the contract was terminated, and control of the facility reverted to the War Department. The RVAAP was placed on a "stand-by" status for munitions production and storage. Between 1946 and 1949, the facility produced ammonium nitrate for use as an agricultural fertilizer in the reconstruction of Europe.

During the United States' involvement in the Korean conflict, the RVAAP was re-activated in 1950, with operations contracted to Ravenna Arsenal, Inc., a subsidiary of the Firestone Tire and Rubber Company, and once again produced and stored a variety of munitions in support of U.S. troops in Korea. In 1957, the RVAAP was again placed on "stand-by" status, at which time the focus shifted from munitions

production to demilitarization. The RVAAP began production again for the Vietnam War. It was returned to standby status in 1971, but continued to demilitarize ammunition until 1991.

The RVAAP munitions storage mission ended in 2004 with the removal of all bulk explosives from earth covered magazines (ECM). Currently there are only a few ECMs in use by tenants and environmental restoration contractors. The OHARNG is using a few as an ammunition supply point (ASP) to support range operations and may expand the ASP to include additional ECMs if needed in the future.

Previous ammunition plant industial operation sites on Camp Ravenna are undergoing environmental restoration due to contamination caused by past industrial activities. The restoration program began in 1989 with the first attempt to identify Solid Waste Management Units (SWMUs) and is expected to have remedies in place on most areas of concern (AOCs) and munitions response sites (MRSs) by 2016 to 2018 with long term monitoring/management for another 30 to 40 years. The Base Realignment and Closure Division (BRACD) managed the Installation Restoration Program (IRP) and Military Munitions Response Program (MMRP) at Camp Ravenna up until 2013 when the ARNG and OHARNG took over program management. This was done to better integrate the cleanup with the OHARNG training mission and to ensure remedies provide for the designated reuse of the property as OHARNG military training.

The OHARNG has used various portions of the former RVAAP since the 1950's for military training. In the 1970's, the OHARNG was issued a license by the DA to use 2,494 acres of the RVAAP for training. The Air Force Reserve also has a license to use 338 acres as a Drop Zone. On May 6, 1999, the USP&FO for Ohio transfered accountability of 16,164 acres of the RVAAP (total facility acreage of 21,683 acres) to the NGB (USP&FO, 1999). Included within the transferred acreage were the property licensed to the OHARNG, the property licensed to the Air Force Reserve, and munitions storage areas utilized by the RVAAP. The transferred 16,164 acres was then licensed to the OHARNG, through the NGB, to be managed and used as a training area. The OHARNG called this site the RTLS. The 338-acre Air Force Reserve Drop Zone license was left in place with the Air Force Reserve. Approximately 3,774 acres and 180 acres of additional land were transferred on 13 May 2002 and 12 August 2005, respectively. On 24 February 2006 an additional 20 acres were transferred and on 30 July 2010 another 20 acres were transferred. The remaining balance of the property was transferred in 2013.

2.2.2 NATURAL RESOURCES MANAGEMENT HISTORY

2.2.2.1 AGRICULTURE

The majority of the installation acreage was in agricultural production at the time of government purchase. The exact history of agricultural use after government purchase is not known. Many of the fields were leased for the production of row crops, forage, and hay. Records are not available, but it is believed that leasing began in the 1940's during the construction of the installation and was done during ammunition production periods up until the early 1970's. Wildlife damage to crops was extensive. Grazing leases for cattle and horses were started sometime in the late 1950's or 1960's. Grazing was done within the munitions storage areas. Some of these areas were fenced and others were not. Cattle would occasionally get loose and roam the installation, and there was a small herd of horses that ran wild for several years. All agricultural leases were stopped when the RVAAP activated for the Vietnam War.

In the 1980's the RVAAP Command pushed to get the agricultural program established again. The local Soil and Water Conservation Service developed a plan to establish row crops and hay production. A contractor was hired to clear brush and return Tract 1 into a hay field. The field was first leased in 1986. Several other fields were advertised for lease; however, there was no local interest. Also in 1986 a 60-acre sugarbush (Tract 2) was leased for the collection of maple sap. Both tracts were leased for three, five-year periods and were not renewed. The hay field is required for the training mission as a tracked vehicle maneuver area. The sugarbush needed a rest and the area it is located in is a unique ecosystem and designated as a Special Management Unit. The sugarbush is not considered a compatible use. In addition, the agriculture program costs more each year to administer ($3,000 to $5,000) than the annual total lease income of approximately $2,000.

2.2.2.2 TIMBER AND FOREST MANAGEMENT

Immediately after acquisition, a large sawmill was set up to saw lumber from timber located on the reservation. This lumber was used in construction of the initial facilities. Approximately 11,490,381 board feet were sawn at that time, which resulted in an extreme shortage of sawtimber growing stock at the end of construction.

In 1954, a tree planting program was started to re-forest abandoned agricultural fields, which consisted predominately of planting conifers. During the first years of conifer planting, the mortality rate amounted to nearly 100 percent, reportedly due to the over population of white-tailed deer *(Odocoileus virginianus)* and browsing. After several years of near failure, hardwoods were planted instead of conifers. In 1963, "Zip", manufactured by Martin Chemical Company, Chicago, Illinois was discovered as a specific deer repellent. Zip repellent was generally effective in preventing deer damage, but because of the high cost of the repellent, and the frequent application necessary, it was discontinued.

The hardwood plantings were marginally more successful than the conifer plantings. There are several marginally successful small white oak *(Quercus alba)* plantations, a tulip poplar *(Liriodendron tulipifera)* plantation, and a white ash *(Fraxinus americana* var. *americana)* plantation along with a few conifer plantations scattered throughout the installation. There are very few areas at Camp Ravenna that are conducive to planting hardwoods without intensive site preparation and a continued weed control effort. Poor site conditions coupled with deer browsing devastated tree plantings.

Major tree planting stopped in the early 1970s. Cattle grazing and agricultural crop leasing was discontinued at about the same time. The result was natural regeneration and the reversion of abandoned pastures and agricultural fields to forests. Once grazing by cattle ceased, the understory and ground cover were able to recover. Today, deformed trees in reverting fields bear witness to previous cattle damage.

While forest resources benefited from cattle removal, the reduced competition allowed the white-tailed deer population to increase. Today, browsing by white-tailed deer is the biggest threat to forest regeneration. Considerable effort is required each year to reduce the herd size to prevent damage, not only to the forest, but also to state threatened and endangered plants.

Since 1965, hardwood sawtimber and/or locust posts have been harvested on an annual basis. Also, timber stand improvement has been ongoing to improve the quality and quantity of timber on the installation. A large amount of poor quality timber was cut in the early 1970s, which reduced the growing stock volume, but provided for the establishment of shade intolerant species and uncrowded growing conditions for advanced regeneration. Harvesting continued through the 1980s and into the 1990s with smaller quantities being cut. The annual harvest is currently less than growth to allow for an increase in the sawtimber base and to meet ecosystem management objectives.

No fires to date on the installation could be classified as woodland fires. Historically, fires at the installation have been related to open burning operations in the burning grounds. The burning area has been closed and burning operations are no longer conducted.

The forests at Camp Ravenna are valuable for much more than timber production. They provide excellent training area for OHARNG. They provide wildlife habitat, soil stabilization, water quality protection, and they are a vital element in the overall biological diversity at Camp Ravenna. The diversity of species and quality of forest habitats is a testament to the success of past and on-going forest management efforts at Camp Ravenna.

2.2.2.3 FISH AND WILDLIFE

Early fish and wildlife management programs were minimal until the formation of the APCO Fish and Wildlife Conservation Club in 1952. The club was made up of RVAAP employees and initiated programs to increase wildlife and fishing opportunities. Game was stocked, lakes and marshes were constructed, and fish were stocked in ponds. Small game hunting was started at the installation. The APCO club began to plant food strips of corn and small grains in the early 1950s, but the program was

unsuccessful because of crop losses as a result of deer browsing. Food plot plantings are now considered contrary to Army ecosystem management requirements.

A limited amount of woodland improvement cuttings were made in the early 1960s. Some of the trimmings were used to construct brush piles. The most important aspect of this program was the rejuvenation of plants in the openings created by tree removal.

In the 1950s the deer herd was beyond carrying capacity. The mortality rate of tree plantings was nearly 100 percent because of deer browsing. Deer hunting began in 1955 and Ravenna is now known across the state for its annual deer hunt. Depending upon what story you hear, the world famous "Hole in the Horn" buck was found entangled in the Camp Ravenna fence (Idol, 1998) or inside the installation on Track 28. Deer hunting pressure was not enough to control the herd until the mid-1980s. Historically, deer herd management consisted of simply trying to have enough hunts and harvest enough deer each year to reach carrying capacity. In the mid-1990s, high numbers of deer hunts began to negatively impact the military mission. Deer herd management is now focused on maintaining the deer herd with fewer hunts by harvesting does.

2.2.3 INSTALLATION RESTORATION PROGRAM

It is not the purpose of this INRMP to present details on the Installation Restoration Program (IRP) or an exhaustive discussion on contamination. Environmental remediation efforts to clean up and restore industrial sites on the property have been underway since the mid-1990's. The program was managed by BRACD up until late 2013 when ARNG and the OHARNG took over management of both the IPR and Military Munitions Response Program (MMRP). All documents produced during the course of the IRP and MMRP are available to the public at the Ravenna Public Library, the Newton Falls Public Library, and www.rvaap.org.

A total of 67 Areas of Concern (AOCs) and 17 Munitions Response Sites (MRSs) have been identified throughout Camp Ravenna. An exhaustive effort was undertaken to identify any site that may potentially be contaminated or contain munitions and explosives of concern (MEC). Sites range from closed sewage treatment plants, to waste oil tank and gas station locations, to the old pest control shop, to munitions assembly lines and demolition and burning areas. Sites are identified based on knowledge of past activity, current activity, or evidence of past activity that may have contaminated the environment. The AOCs and MRSs are primarily associated with the load lines where explosives were melted and poured into shell casings, the demolition and burning areas where unserviceable munitions and munition wastes were detonated or burned for disposal, and sites where munitions or explosives were test fired or detonated.

Sites may be contaminated with explosives (mostly nitrogen-based), MEC, heavy metals, volatile and or semi-volatile organic compounds, petroleum products, polychlorinated biphenyls (PCB), synthetic organic compounds (pesticides), or other substances associated with the loading, assembling and packing and testing and development of conventional munitions. Sampling is done in soils, sediments, surface water, and ground water to confirm or deny the presence of contamination and to determine the nature and extent of contamination if it exists. Studies to date indicate that most of the contamination is isolated to specific locations around process buildings and treatment sites within the top one to two feet of soil and in the sediments of settling ponds and ditches.

An extensive surface water quality study was done by the USACE and the OEPA in 2003. The study used the OEPA developed methodologies to evaluate water quality by analyzing biological diversity in aquatic ecosystems. The USACE findings support the OHARNG aquatic planning level surveys (PLSs) and habitat evaluations that surface water quality on a facility-wide basis at Camp Ravenna is excellent. The implications of this study to specific AOCs and MMRP sites and their remediation has not yet been determined.

Many ground water monitoring wells have been installed throughout Camp Ravenna. The water from these wells and from private wells on property adjacent to the training site has been sampled for the presence of RVAAP contaminants of concern (COC). No COCs were found in private wells adjacent to

Camp Ravenna. Ground water contamination has been found in some of the ground water monitoring wells installed within the Camp Ravenna fence line. The evaluation of ground water sampling is still underway with new wells added as needed. Wells installed in 2012 near the south permiter south of Load Line 3 and near the Portage-Trumbull County line suggest groundwater contamination may extend off post. Additional ground water monitoring wells are proposed for these areas. Development of ground water wells for potable water is not preferred by the Ohio EPA but can be done in some areas when small quantities of water are needed. Ground water development on a large sacle is currently not, and may never be, possible at Camp Ravenna.

The locations of the AOCs and MRSs are well documented, but exact boundaries are not known for all AOCs and MRSs. Siebert stakes or fencing is used to delineate them in the field. Only military training and natural resources management operations considered compatible with remediation are conducted in within AOCs. The OHARNG works to ensure restoration activities, military training, natural resources management, and other activities do not conflict with each other and that all support the military training mission. The potential impact of contamination from past industrial activities and the potential presence of MEC are considered in all training land use and development and natural resource management projects. Activities incompatible with the remediation and approved land uses at AOCs and MRSs are not permitted.

Based on projected funding, all remedies for AOCs are expected to be in place by 2016 to 2018 with long term monitoring potentially extending another 30 to 40 years. Remedies are expected to be inplace by 2016 for the MRSs with long term monitoring until 2048. Land use controls are expected to be required indefinitely on some sites.

2.3 MILITARY MISSION

The OHARNG mission at Camp Ravenna is structured to command, operate, manage, and administer services of the facilities, as well as assign use of resources to ensure training and logistical support to National Guard units from within the State of Ohio, National Guard units from other states, other Reserve Components, Active Components, Federal government organizations, state and local agencies and civic groups.

At the Federal level, the OHARNG maintains combat ready units, with soldiers available to mobilize in support of national military strategy. At the State level, the OHARNG provides organized, trained, and equipped units to protect life and property, as well as to preserve peace, order and public safety, and to act in the event of a disaster when so ordered by the Governor of the State of Ohio. The OHARNG also supports a community mission to participate in local, state and national programs designed to enhance the quality of life for all its citizens.

The OHARNG mission at Camp Ravenna also includes facility maintenance, roads and grounds management, natural and cultural resources management, environmental regulatory compliance, environmental restoration, and training site development (Master Planning, demolotion, renovation and new construction). These programs and activities support the broader military training mission.

2.4 LAND USE

Land at Camp Ravenna is categorized as improved, semi-improved, and unimproved grounds. Improved grounds are those intensively maintained and usually include cantonment areas. There are approximately 411 acres of improved grounds. Semi-improved grounds are areas that receive some maintenance, but are not as intensively maintained as improved grounds. A total of 2500 acres are classified as semi-improved grounds. Unimproved grounds are those that receive little or no regular maintenance. The bulk of the Camp Ravenna acreage fits into this category. There are approximately 18,772 acres of unimproved land. Greater detail on maintenance techniques for the different land uses is provided in **Section 6.7**.

Present facilities at Camp Ravenna include three cantonment areas, light maneuver areas, a number of land navigation training courses, a 12.5-mile tracked vehicle driver's training course, a drop zone, dismounted tactical training areas, a 21-mile wheeled convoy route, air space for military aircraft

training, and a MK-19 Range. To support troops utilizing these training facilities, Camp Ravenna contains several bivouac sites, assembly and staging areas, and 300-person barracks.various ambush and improvised explosive devise (IED) lanes, a combatives training area, an IED and familiarization area, air space for military aircraft drop and sling load training, a simulated collapsed structure, a simulations center, an Armored Training Center (ATC), an Tank and Bradley Fighting Vehicle Gunner Table II Range, a MK-19 Range, a 25 Meter Known Distance Range, a modified Pistol Range, two Hand Grenade Qualification Courses, an M-203 Range, a Live Fire Hand Grenade Familiarization Course, a Live Fire Engineer Demolition Range, and a No SDZ Shoot House. A range complex has been identified that contains these ranges and additional ranges such as a Modified Record Fire (MRF) Range, a Multi-Purpose Machinegun (MPMG) Range, a Combat Pistol Military Police Fire Qualification Course (CP/MPFQC) and a Fire and Manuever (F&M) Range. Camp Ravenna also supports the OHARNG Regional Training Institute (RTI) with classroom space and training area for heavy equipment operators, carpenters, masons, military Policy and truck drivers. The U.S. Army Tank Automotive Command (TACOM) is a tenant on Camp Ravenna and utilize the post for new equipment training such as heavy engineer equipment and water trucks. To support troops utilizing these training facilities, Camp Ravenna contains several bivouac sites, assembly and staging areas, some classroom space, three barracks, a Tactical Training Base (TTB), Buckeye Village (troop billeting area), a static fuel point and a wash rack. In addition Camp Ravenna is home to the Unit Training and Equipment Sites (UTES) which maintains and issues equipment and vehicles utilized by OHARNG troops who train at Raveen. These facilities are further described below. Refer to **Figure 3** for an installation map.

2.4.1 CANTONMENT AREAS

There are three cantonment areas at Camp Ravenna. Currently, the main cantonment area is Cantonment Area 3 located in the southeast corner of Camp Ravenna in Trumbull County (**Figure 3**). This site houses the OHARNG's Newton Falls Readiness Center, Camp Ravenna Headquarters (to include Range Control), the Environmental Office, some RTI classrooms, the Barracks, Buckey Village, the main UTES Compound, a fuel point, a wash rack, the Simulation Center, State Maintenance Area, two helipads and the ATC.

Cantonment Area 1 is located in Portage County off of State Route 5 at the Main Gate and the old RVAAP Administration Area. This area was formerly used by BRACD as their administration area. This is the main access point for the majority of training activity on post and the OHARNG is the process of running water and sewer lines to the area so it can once again be developed as the main cantonment area. There are currently 4 potable ground water wells and three septic systems that provide limited occupation of the area. BRACD leases office space in building 1038 for three personnel. Camp Ravenna is in process of converting building 1037 into the Range Control office. Building 1067 is used for Range Control operations and field crews. Building 1038 is slated for renovation and use as an interim post headquarters. Building 1068 has been renovated and is the Department of Public Works (DPW) office. Building 1036 is utilized as a field office for environmental restoration contractors. Building 1047 is the less than 90 day hazardous waste storage area. Buidling 1034 is slated for reuse as a State Maintenance facility and building F-6 is used for gate security personnel. In addition, building 1035 is licensed to a non-profit humanitarian aid organization.

Cantonment Area 3 consists of the Group 8 buildings. This area is utilized by Camp Ravenna Range Control for supply and targetry storage. It also functions as a shop for making wooden target, repairing target lifters and charging target lifter batteries. The area is also utilized by the UTES for dehumified storage of vehicles.

The Tactical Training Base (TTB) at the North Gate is sometimes referred to as a cantonment area as well. This area is used to house soldiers on site for annual training and other extended training periods. It is made up of several former munitions storage warehouses converted to billeting and administractive offices. Potable water, municipal sewer, natural gas, electricity, and communications have been brought in to this area from the Village Windham. A restroom and shower facility has been built and road and parking improvements made. The UTES also has a satellite shop operating out of a clamshell shelter

that provides maintenance support to the RTI and TACOM who utilize one of the buildings as a classroom and an adjacent dig site training area for teaching heavy equipment operators.

2.4.2 UTILITIES

Electric service is provided to Camp Ravenna by a local commercial provider. Electricity comes onto Camp Ravenna in six locations. There are two underground and one above ground ingress points servicing the Cantonment Area 3 in Trumbull County. There are three above ground ingress points servicing the Portage County portion of the training site.

Potable water and sewer are provided by the City of Newton Falls for Cantonment Area 3 in Trumbull County. There is also natural gas in Cantonment Area 3.

There are four potable ground water wells servicing Cantonment Area 1 in the Portage County portion of Camp Ravenna. Each of these wells service less than 25 personnel and are non-public water sources. Buildings on this service include Building 1037, F-6, Building 1034, Building 1038, Building 1067 and Building 1068. Sewer is provided for the active buildings on the Portage County side via one mounded septic system and two recirculating septic systems. There is no natural gas service to Cantonment Area 1. Propane is used to fire furnaces for heat.

The OHARNG is the process of running water and sewer lines from the Village of Windham to Cantonment Area 1. Water, sewer and natural gas services current come on post as the North Gate from Windham and extend to the TTB. The water and sewer lines are expected to be extended to Cantonment Area 1 within three to five years.

Cantonment Area 2 has electric service. There is no water or sewer and no natural gas service to this area.

2.4.3 LOGISTICAL ASSETS

The OHARNG controls over 800 buildings/structures scattered throughout Camp Ravenna. Many of these buildings are empty munitions storage structures discussed below. Some of these buildings are fitted for dehumified storage of military equipment. Other buildings are used for cold storage of unit equipment. Camp Ravenna also has a 19-tack railroad classification yard used for shipping and receiving military equipment.

2.4.4 MUNITIONS STORAGE AREAS

Munitions at Camp Ravenna were previously stored in earth covered magazines ECMs. There are ten ECM munitions storage areas at Camp Ravenna. Portions of C-Block are active storage areas used as an OHARNG Ammunition Supply Point (ASP), Conditionally Exempt (CE) Storage for the restoration program, and tenant storage. Wet Storage, Group 1, 1-A, Blocks A, B, D, E, Group 5 and Group 7 are inactive munitions storage areas. Two ECMs in wet storage can also be used for CE storage if needed. Above-Ground Magazine Storage Areas Group 2, Group 3, and Group 4, and the Standard Magazine Area are also currently inactive munitions storage areas, but some are used for inert storage of unit equipment and training support. The buildings in Group 2 have been converted into classrooms, billeting, and support building and used as a TTB. The total number of explosive storage ECM's (active and inactive) is 685. There are two additional non-usable ECMs (GE 2 and GE 3) on Greenleaf Road near Group E, one in Open Demolition Area #2 and one on the MK-19/MPMG Range. The inactive ECM's are included in Unimproved Grounds. The active ECM's are included in Semi-Improved Grounds. Some of the empty ECMs throughout Camp Ravenna are designated as emergency tornado shelters. The number, location, and length of the ECMs are described in **Table 1**.

TABLE 1 – EARTH COVERED MAGAZINES (ECMS) AT CAMP RAVENNA				
LOCATION OF ECMS	MEANS OF ACCESS	NO. OF INACTIVE ECMS	NO. OF ACTIVE ECM'S	LENGTH OF ECMS
A Block	Road	100	--	80 feet
B Block	Road	95	--	60 feet
C Block	Road	87	12	60 feet
D Block	Road	99	--	60 feet
E Block	Road	60	--	60 feet
Wet Storage	Road	2	--	40 feet
Group 1	Rail	40	--	60 feet
Group 1-A	Rail	80	--	60 feet
Group 5	Rail	44	--	40 feet
Group 7	Rail	66	--	40 feet
Total	--	673	12	--

2.4.5 TRANSPORTATION SYSTEM

Ingress and egress at Camp Ravenna is controlled through designated and controlled access points. The Main Gate (Post 1) to Camp Ravenna is accessed from SR 5. The East Gate is along SR 534 and provides access to the Camp Ravenna Cantonment Area 3 and TAs in Trumbull County (**Figure 3**).

Within the installation, transportation is provided via designated roadways and trails. Most Camp Ravenna roadways are paved; however, some designated roadways or trails within the TAs are not. Pavement on road surfaces is not being maintained. Most road surfaces are in poor condition and being allowed to deteriorate to a gravel surface. The road network at Camp Ravenna is extensive, with over 200 miles of roadways.

Most railroad lines within the installation have been deactivated. Rails and ties have been removed, leaving only ballasted rail beds. Only the 19-track rail classification yard on the east side of the installation and a 3,800-foot spur that extends westward from the classification yard remain in service. There is currently a total of 10.62 miles of active railroad track.

2.4.6 LIGHT MANEUVER AREAS

Nearly the entire 21,683 acres of Camp Ravenna, except for AOCs and MRSs, are capable of supporting light maneuver training. Range Control has divided the post into numbered training areas and developed a map showing these training areas. Light maneuver areas include a range of habitat types from forested, scrub-shrub areas, open fields, wetlands, to developed areas with buildings. Assets include old administration and housing areas used as provisional Military Operations in Urban Terrain (MOUT) sites, non-ethnic specific training village, multiple land navigation courses, acres of land for forced marches and force on force training, drop zones, a 21-mile wheeled vehicle convoy route with ambush sites, a 12.5-mile tracked vehicle driving course, several bivouac sites, vehicle staging areas, artillery maneuver areas, helicopter hot refueling sites, helicopter sling load training area, nap of the earth flying lanes, and helicopter hover locations.

2.4.7 HEAVY MANEUVER AREAS

There is a 60 acre grassland tactical vehicle maneuver area north of the TTB and east of the North Dig Site. This area is available for seasonal off-road maneuver training with wheeled and tracked vehicles. This area currently receives a minor amount of use because it cannot sustain heavy use. A design for storm water controls to manage surface water discharge has been developed. Construction of controls will be done as funding is avialble. In the iterim the training area will continue to receive ligh usage. Heavy vehicle maneuver is also done in the former Group 7 munitions storage area utilizing the old railroad track beds. The habitat in Group 7 is a combination of old

field and forest with remanants of old srapes (shallow borrow sites) from 1940 construction throughout. When the soil is dry or frozen some limited maneuver on old mowing access trails is permitted. The railroad beds on the north end of the former Group 1 ammunition storage area have been converted into an "off-road" driving course for truck driver training. This is a designed and constructed obstacle course that provides the required obstacles and challenges required for driver certification with no degradation to the environment and natural resources. The course is within a forest habitat and adjacent to the range complex. There is also a 12.5 mile tracked vehicle driving course on specified roads with concrete reinforced turning pads at road intersections. This driving course traverses through approximately ¼ of the Camp Ravenna property. When tracked vehicles are using this course Range control shuts down other vehicle traffic on the roads.

2.4.8 ENGINEER HEAVY EQUIPMENT TRAINING AREAS

There are two Egineer heavy equipment training areas at Camp Ravenna, the South and North Dig Sites. The South Dig Site is approximately 40 acres and the North Dig Site is approximately 21 acres. These training areas are used to train soldier in the operation of heavy Engineer equipment such as pans, bull dozers and loaders. The sites are predominately bare earth and so sediment discharge is a concern and is regulated by the Ohio EPA. Intense storm water management controls are in place and an Individual Industrial Storm Water NPDES Permit is required to operate these training areras.

2.4.9 DROP ZONES

There are two drop zones at Camp Ravenna. The Slagle Drop Zone or Drop Zone J is a 3,600-foot by 3,600-foot area (approximately 300 acres) licensed to the 910th Air Wing, Air Force Reserve out of Vienna Ohio. The actual drop zone area is about 400 acres. The area was constructed in an old field in the late 1980's and consists of 100+ acres of open grassland surrounded by forest. The second drop zone was newly established with the August 2004 RTLS EA. This area is called YAK Drop Zone and is located at the southeast corner of the intersection of South Patrol Road and Route 80. It consists of a 60-acre grassland.

2.4.10 RANGES

Ranges at Camp Ravenna include a Tank and Bradley Fighting Vehicle Gunnery Table II Range, a MK-19 Range, a 25 Meter Known Distance (KD) Range, a modified Pistol Range, two Hand Grenade Qualification Courses, an M-203 Range, a Live Fire Hand Grenade Familiarization Course, a Live Fire Engineer Demolition Range, and a No SDZ Shoot House. The Gunnery Table II Range is a 1/5 scale laser range. The MK-19 range is a practice target round range. High explosive 40mm roads have not been fired on this range. The KD range is a standard 25 meter range. The Pistol Range is an old range once used by the ammunition plant security force that has been upgraded for use by the OHARNG. The Hand Grenade Qualification Ranges are for non-explosive dummy grenades only. Target practice 40mm rounds are fired on the M-203 Range. Live hand grenades are used on the Hand Grenade Familiarization Range and live high explosives are used on the live demolition range. The shoothouse is self-contained and utilized by units and local law enforcement to train on clearing buildings. In addition, blank ammunition is used throughout Camp Ravenna and on the Convoy Routes and the Gunnery Table II Range.

2.4.11 AIR SPACE

Air space over Camp Ravenna is not restricted. General Federal Aviation Administration (FAA) regulations apply to overflights. Range Control coordinates altitude restrictions with the FAA as applicable when ranges are in use.

2.4.12 PROPOSED FUTURE FACILITIES

The OHARNG completed the NEPA review process to increase training and develop training site facilities at in 2004 as well a Supplemental EA's for development of the RTI Engineer Training School (March 2008) and implementation of the Range Development Plan (April 2009). Training site development projects are not part of this INRMP, but they are briefly mentioned to identify the types of activities and projects supported by the INRMP. Natural resources management requirements are given consideration by the OHARNG in training site development and management. The natural resources management program is in place to support training and assist in training site usage and development by providing

for things like effective vegetation control, optimal siting of new construction and training activities for sustainable use, soil stabilization and seeding recommendations, and timber salvage as needed for construction projects.

Training site usage and development priorities change as missions and funding availability change. Some of the development projects and expanding training missions have been implemented or are underway. Proposed expansion plans yet to be fully implemented include: Range Complex Projects (Modified Record Fire (MRF) Range, a Multi-Purpose Machinegun (MPMG) Range, a Combat Pistol Military Police Fire Qualification Course (CP/MPFQC), a Fire and Manuever (F&M) Range, Live Breach Facility, Urban Assault Course, and Modified Combined Arms Collective Training Facility (CACTF)); Cantonment Complex Projects (Bachelor Officer Quarters/Bachelor Enlisted Quarters, 300-Soldier Barracks, Consolidated Dining Facility, Troop Recreation Area, and Cantonment Parking Expansion); Equipment Storage/Maintenance/Support Projects (Maintenance Lanes Facility, Field Service Center, a Combat Support Engineer Company Complex with motor pool, readiness center, and maintenance shelter, and a UTES Motor Pool and Service Road); and Infrastructure Projects (Bridge Rehabilitation, Utilities Infrastructure including water, sewer, and electricity, Armor Training Center Road Network Improvements, and Secured Class IV Storage Area). Details about these projects are contained in the *Environmental Assessment of Enhanced Training and Operations at the Ravenna Training and Logistics Site, Portage and Trumbull Counties, Ohio*, August 2004 and subsequent 2008 and 2009 Supplimental EA's and the Camp Ravenna Master Plan (May 2009).

Projects identified in the Camp Ravenna EAs were developed in coordination with natural resources and environmental personnel. The INRMP identifies erosion control requirements, soil stabilization and seeding requirements. Timber harvests are scheduled to support known projects. Additional harvests are done to salvage timber from new unscheduled projects. Wetland, endangered species, and archeological surveys are conducted to support training and training site development projects. Wetland fill permits and mitigation, storm water construction permits and other NPDES permits are obtained as needed. Training site development and training events are located in areas that provide for mission completion with the least amount of negative environmental impacts.

2.5 TYPES OF MILITARY TRAINING CONDUCTED AT CAMP RAVENNA

Camp Ravenna is primarily used by the OHARNG but all branches of the Armed Service, as well as non-militarty law enforcement and emergency management agencies, use or have used the training site facilities. Training includes both mounted and dismounted tactical training. Dismounted training includes small unit infantry tactics, reconnaissance, terrain and map analysis, escape and evasion tactics, infiltration tactics, land navigation, patrolling, and tactical concealment/bivouacking. Bivouacking involves establishing temporary field quarters for as little as one or as many as several platoons or companies. Temporary infrastructure for bivouacs consists of vehicle parking, tents, portable latrines, potable water, and gray water holding tanks.

Mounted training includes a tank driving course, artillery maneuver, tank and artillery simulator training, tank drive course, wheeled convoy course, night vision driving, and use of a Gunnery Table II Range (1/5 scale laser range) for the M-1 tanks Bradley Fighting Vehicles. Field activities conducted in light maneuver areas include tracked vehicle training, on-foot maneuvers and wheeled vehicle training. Mounted training is conducted mostly on established roads. Minor off-road vehicle training can be done when soil is dry. Off-road training is not done in wetlands, forests or when the soil is saturated and unable to support the training without rutting or damaging the soil. Constructed trials with storm water controls and existing roads are used for recurring vehicle and equipment training. When off-road training is required it is conducted in prepared off-road training areas. Vehicles are allowed off-road to drop off equipment and supplies in bivouac areas. Areas routinely used are hardened with stone.

Live fire ranges are available at Camp Ravenna as described above in Section 2.4.10. Additional ranges are planned for the future. Currently, blanks up to 50 cal are used throughout the training site.

Camp Ravenna also has a simulated collapsed structure and a training area for unit level to large joint agency Homeland Response Forces (HRF) training excercises. Engineer equipment training, military police, combat engineer, truck driver, carpenter and mason schools are located at Camp Ravenna. Engineer units not associated with the RTI also do minor construction and maintenance projects at Camp Ravenna as part of their required training tasks. Units preparing to deploy also conduct pre-mobilization training at Camp Ravenna.

Drop Zone J (Sagle DZ) is used for personnel parachute and cargo drops from fixed-wing and rotary aircraft. Other rotary-wing aircraft training includes rappelling, fast rope operations, combat assault training, external sling load operations, nap of the earth night-vision flying, hot refueling, and hover training. Fixed wing aircraft also use Camp Ravenna airspace for aerial spray training (water only).

2.6 CAMP RAVENNA CURRENT FACILITY USAGE

Facility usage varies from year to year depending upon the training needs of units and deployments. Some required training, such as main gun firing of tanks and Bradley Fighting Vehicles, cannot be done at Camp Ravenna. When units need to go to other training sites or are deployed, the training man-day throughput decreases. Average total (all users of Camp Ravenna) man-day training throughput is approximately 90,000 to 95,000 man-days per year with a range of 70,000 to 115,000 man-days per year. The average OHARNG man-day training throughput is approximately 75,000 to 80,000 man-days per year with a range of 35,000 to 102,000 man-days per year. With the construction of live fire ranges at Camp Ravenna both total and OHARNG usage is expected to increase. Usage could conceivably double. Camp Ravenna has already seen increases with the few ranges that have been constructed.

2.7 LOCAL LAND USE AND SURROUNDING COMMUNITIES

Land use is the way land is developed and used in terms of the types of activities allowed on it. Human-modified land use categories include residential, commercial, industrial, transportation, communications and utilities, agricultural, institutional, governmental, recreational and other developed use areas. Management plans and zoning regulations determine the type and extent of land use allowable in specific areas. Zoning regulations are often crafted with the intention of protecting specially designated or environmentally sensitive areas.

The area immediately adjacent to the Camp Ravenna boundary is rural with a mixture of farms, single family homes, trailer parks, outdoor recreation and camping areas, and some small industrial operations. The majority of the area is zoned as agricultural and rural residential with isolated industrial and commercial zones. Only one significant industrial facility, located in Windham, exists in the immediate area surrounding Camp Ravenna.

Local communities near Camp Ravenna include the City of Ravenna (11,739 residents), the City of Newton Falls (4,770 residents) to the southeast, the Village of Windham (2,213 residents) to the north, and the Village of Garrettsville (2,262 residents) to the northeast. The City of Warren, with over 41,000 residents, is located approximately eight miles east-northeast of Camp Ravenna (U.S. Census, 2010).

There are no permanent residences on-site at Camp Ravenna. Personnel employed at the facility commute from the surrounding area on a daily basis.

2.8 REGIONAL LAND USE AND LAND COVER

Northeast Ohio includes the Cleveland-Akron area (approximately 3 million residents) and the Canton-Youngstown-Medina area (approximately 200,000 residents) (U.S. Census, 2010). The region, bordered to the north by Lake Erie, is characterized by a rolling landscape composed of low rounded hills with scattered end moraines and kettles. Soils are generally less fertile than other glaciated regions. Both urban-industrial activity and agriculture (dairy, livestock, corn, and soybeans) are common. Many ridges and lowlands are wooded. The growing season becomes progressively shorter as the distance from Lake Erie increases (Bailey et al. 1994).

Land use trends include the conversion of larger parcels to smaller ones, with associated increases in the number of landowners. Farms are being converted into smaller ownerships or housing

developments within this region. This increased development is impacting surface water via erosion and riparian vegetation. The majority of forest lands are privately owned in relatively small woodlots, making regional ecosystem management difficult. **Table 2** provides a summary of regional land cover within northeastern Ohio (OEPA, 2005).

TABLE 2 – NORTHEASTERN OHIO LAND COVER

LAND USE CLASSIFICATION	APPROXIMATE ACREAGE	PERCENT LAND COVER
Bare/Mines	7,478	0.1
Commercial/Industrial/Transportation	197,275	3.2
Coniferous Forest	30,677	0.5
Deciduous Forest	2,656,130	42.8
Herbaceous Wetland	18,233	0.3
Pasture	545,063	8.8
Residential	677,181	10.9
Row Crops	1,761,100	28.4
Urban/Recreation Grasses	53,621	0.9
Water	87,379	1.4
Woody Wetland	175,855	2.8
Total	6,209,993	100.0

Source: OEPA, 2005

2.9 LOCAL AND REGIONAL NATURAL AREAS

Northwest Ohio includes several parks and natural areas. These include the Michael J. Kirwin Reservoir, state and local parks, nature preserves, and the Cuyahoga Valley National Park.

The Michael J. Kirwin Reservoir was developed by the USACE for flood control, water supply, recreation and fish and wildlife management. It was completed in 1965 and is managed by the USACE. The reservoir is surrounded by the West Branch State Park, managed by the ODNR. West Branch State Park was formally opened in 1966. The reservoir and West Branch State Park are located on the west branch of the Mahoning River in Portage County. West Branch State Park contains numerous bogs filled with buttonbush (*Cephalanthus occidentalis* var. *occidentalis*), hazel alder (*Alnus serrulata*), skunk cabbage (*Symplocarpus foetidus*) and swamp white oak (*Quercus bicolor*). Another natural feature of the park is the stand of beech (*Fagus grandiolia*)-maple (*Acer saccharum*) forest, part of the beech-maple forest once extending from Mansfield, Ohio to Pennsylvania. Recreational activities at the park include boating, camping, picnicking, swimming, fishing, hunting, and 12 miles of trails. Trails include a portion of the State's Buckeye Trail, snowmobile trails, bridle trails, and mountain biking trails.

Other area state parks include Tinker's Creek, Nelson-Kennedy Ledges State Park, Lake Milton, Quail Hollow, Punderson and Mosquito Lake State Parks (ODNR, 2012).

The Ravenna Parks and Recreation Department maintains a combined 92 acres of woodlands and recreational areas for residents to enjoy. Additionally, a hike and bike trail runs through the City of Ravenna, which is part of a larger network of trails that will eventually extend eastward to Warren, Ohio and westward to Summit County, which will tie into the Metro Parks system (City of Ravenna, 2012).

Regional natural areas include areas managed by The Nature Conservancy (TNC) and the ODNR – Division of Natural Areas and Preserves (DNAP). TNC manages seven preserve areas within northeast Ohio, which include Morgan Swamp, Stillfork Swamp, Brown's Lake Bog Preserve, White Pine Bog Forest, Beck Fen Nature Preserve, Herrick Fen Nature Preserve, and Flatiron Lake Bog (TNC, 2012).

ODNR - DNAP recognizes 90 preserves that are open to the public, and an additional 44 state nature preserves open only through a written permit. Approximately 20 public nature preserves are located in northeast Ohio with nine of these located in Portage County. An additional four preserves, which require a permit, are located in Portage County. These include Mantua Bog, Gott Fen, and two of the TNC preserves (Beck Fen Nature Preserve and Flatiron Lake Bog). No natural preserves were listed for Trumbull County (DNAP, 2012).

The Cuyahoga Valley National Park is located between the Cities of Cleveland and Akron. The park includes over 32,000 acres of forests, hills, wetlands, canals, and 22 miles of the Cuyahoga River. In the early 1960s spreading development threatened to take over this valley. Citizens and state and local governments joined forces to save the green space and historic features. The National Park Service (NPS) became involved and in 1974 Congress created Cuyahoga Valley National Park as an urban park of the National Park System. The NPS manages the park in cooperation with others who own property within its boundaries, including Cleveland Metroparks and Summit County Metro Parks. The park contains a variety of wildlife, tree species, and wildflowers, as well as manmade features, such as the Ohio & Erie Canal Towpath (GORP, 2012).

SECTION 3: THE PHYSICAL ENVIRONMENT

3.1 CLIMATE

The climate of the Camp Ravenna area is described as a temperate, hot summer zone. Changes in weather patterns occur every few days from passing cold or warm fronts that generally approach northeastern Ohio from the northwest or southwest. Camp Ravenna is located on the fringe of the "snowbelt" area of Ohio that is influenced by the presence of the Great Lakes. Prevailing winds are ordinarily from the southwest. Average wind speed is highest, twelve miles per hour, in spring (Natural Resource Conservation Service [NRCS], 1992).

The average temperature of the coldest month, January, is 25.3 Fahrenheit (°F), and the average temperature of the warmest month, July, is 70.1°F. The average growing season for the Camp Ravenna area is 163 days. The average dates for spring and fall killing frosts are May 1 and October 19, respectively. In areas with more hills and depressions, temperatures display more variance. The average rainfall for the area is 39.2 inches and the average snowfall is 40 inches. Most precipitation occurs in late spring and summer, and the driest month is February. Average monthly rainfall and temperatures are provided in **Table 3** for Warren, Trumbull County, Ohio, located approximately 15 miles northeast of Camp Ravenna.

TABLE 3. AVERAGE RAINFALL AND TEMPERATURES IN WARREN, TRUMBULL COUNTY, OHIO (1981 – 2010)

MONTH	AVERAGE RAINFALL (INCHES)	AVERAGE TEMPERATURE (°F)		
		MINIMUM	MAXIMUM	AVERAGE
January	2.4	16.5	34.0	25.3
February	2.0	17.5	37.3	27.4
March	2.7	24.7	47.0	35.9
April	3.3	34.6	60.2	47.4
May	4.0	43.8	70.1	57.0
June	3.8	53.5	78.7	66.1
July	4.5	57.6	82.5	70.1
August	3.2	56.2	81.1	68.7
September	4.1	49.1	73.7	61.4
October	3.2	38.4	62.1	50.3
November	3.2	30.9	50.3	40.6
December	2.8	21.4	37.9	29.7
Year	39.2	37.0	59.6	48.3

Source: ncdc.noaa.gov, accessed 1/29/2014

The OHARNG understands that there is potential for climate change to impact military training opportunities at Camp Ravenna. According to the High-Level Climate Change Vulnerability Assessment, Department of Army (2013), the primary management concerns at Camp Ravenna related to climate change will be more increased severe weather events and potential for more insect and disease outbreaks due to milder winters. Understanding the challenges that climate change poses, the OHARNG supports the development of a vulnerability assessment to better understand the potential impacts related to a changing climate. However, the abundance and distribution of species and habitats on OHARNG properties is too small in scale to address comprehensive climate change vulnerabilities. For this reason, the OHARNG will review existing regional plans, partnerships or other reports that various agencies, universities, or non-profits are conducting in Ohio on assessing, developing, and implementing climate change adaption strategies. The OHARNG

will continue to identify and implement adaptive natural resource management strategies that provide sustainable ecosystems regardless of whether climate changes occur."

3.2 TOPOGRAPHY AND DRAINAGE

Topography is the change in vertical relief (i.e., elevation) over the surface of a predefined land area. An area's topography is influenced by many factors, including human activity, underlying geologic material, seismic activity, climatic conditions and erosion. A discussion of topography typically encompasses a description of surface elevations, slope and distinct physiographic features such as mountains, ravines or depressions.

Camp Ravenna is located in the Appalachian Plateau Physiographic Region of northeastern Ohio. Although the land within this region was uplifted as part of the Appalachian Mountain building process, the glaciers were able to override the gentle hills of the plateau. Huge ice blocks broke free from the glaciers and kettle lakes formed as the blocks melted. Eventually, these lakes filled with sediment leaving boggy wetlands with unique assemblages of plants. Ridges and flat uplands, which are covered within thin drift and dissected by steep valleys, occur generally above 1200 feet above mean sea level (AMSL). Valley segments, ranging in elevation from 600 feet AMSL to 1500 feet AMSL, alternate between broad drift-filled and narrow rock-walled reaches (Brockman, 1998).

Camp Ravenna is located in the Mahoning River Basin (USEPA, 2012). Three major streams (South Fork Eagle Creek, Sand Creek, and Hinkley Creek) drain approximately 65 percent of the facility. The northern and central portions of the property are drained by Sand Creek, with a total drainage area of 13.5 square miles (8,640 acres). Sand Creek subsequently drains to South Fork Eagle Creek, which has a drainage area of 30.7 square miles (19,648 acres) and runs into Eagle Creek and finally the Mahoning River. The western portions of Camp Ravenna drain to Hinkley Creek, a 7.2 square mile (4,608 acres) drainage basin, and subsequently to the West Branch of the Mahoning River. The eastern-most portion of the installation drains to the West Branch of the Mahoning River near its confluence with the main trunk of the Mahoning River. The southern areas drain directly into Michael J. Kirwin Reservoir. A number of smaller, unnamed creeks drain other areas of the facility (U.S. Geological Survey [USGS], 2002).

Overall the Camp Ravenna installation area can be considered flat land, although there are occasional steep slopes. Many of the steep slopes are due to modifications of the landscape from cut and fill operations during the construction of the ammunition plant in the 1940's. The topographic relief across Camp Ravenna is approximately 290 feet, with the elevation high point located in the northwest portion of the site, at approximately 1,220 feet above sea level. The lowest point elevation of Camp Ravenna is located in the southeast corner of the site, at approximately 930 feet above sea level. Elevation contours shown on **Figure 4** indicate the topographic conditions of Camp Ravenna.

3.3 GEOLOGY AND SOILS

Geologic resources of an area typically consist of surface and subsurface materials and their inherent properties. Geologic factors influencing the ability to support structural development are seismic properties (for example, potential for subsurface shifting, faulting or crustal disturbance), soil stability, and topography. Soils are unconsolidated materials overlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil structure, elasticity, strength, shrink-swell potential and erodibility determine the ground's ability to support human activities, man-made conservation practices, structures and facilities. Soils are typically described in terms of complex type, slope, physical characteristics and relative compatibility or constraining properties with regard to types of land use and/or construction activities.

3.3.1 CAMP RAVENNA GEOLOGY

Camp Ravenna is situated within the glaciated Allegheny Plateau section of the Appalachian Plateaus Province. The general terrain is gently rolling, which is characteristic of post-glacial moraine formations. Surface geology at Camp Ravenna generally consists of glacial till deposits from the

Wisconsinan glacial advance, with occasional outcrops of bedrock of the Pottsville formation. The surface of the eastern two-thirds of the Camp Ravenna property is occupied by the clay-rich and relatively impermeable Hiram Till and associated outwash plain, while the western one-third is covered by the Lavery Till, a silty, sandy material with a few cobbles and sporadic boulders (Winslow and White, 1966).

Pre-glacial valleys were deepened by scouring and subsequently buried during two minor glacial advances and retreats. The first advance occurred over the entire installation, depositing the Lavery Till at a thickness of 20 to 40 feet. The second advance covered only the eastern two-thirds of Camp Ravenna depositing the Hiram Till (Kammer, 1982). The Hiram Till consists of 12 percent sand, 41 percent silt, and 47 percent illite and chlorite clay minerals, and ranges in depth from 1.5 to 4.6 m (5 to 15 feet) below ground surface (bgs). The Hiram Till overlies thin beds of sandy outwash material in the far northeastern corner of the facility. The Till thickness throughout the property ranges from less than three feet in some locations to approximately 45 feet (Author unknown, 1998).

The uppermost bedrock underlying Camp Ravenna consists of several units of the Pottsville sandstone formation of Pennsylvanian age. The Pottsville formation is underlain by Mississippian-age shale of the Cuyahoga formation. The Pottsville formation varies in composition from coarse, permeable sandstones to impermeable shales (Winslow and White, 1966).

3.3.2 CAMP RAVENNA SOILS

Soils are unconsolidated materials overlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil structure, elasticity, strength, shrink-swell potential and erodibility determine the ground's ability to support man-made conservation practices, structures and facilities. Soils are typically described in terms of complex type, slope, physical characteristics and relative compatibility or constraining properties with regard to types of land use and/or construction activities.

Soil types at Camp Ravenna exist as a glacial veneer, and for the most part were formed in glacial till ground moraines on upland areas. Small pockets of end moraine material also exist throughout the installation. The soils covering the majority of the installation have a thin layer of topsoil, are heavy textured, seasonally wet, strongly acidic, and limited in productivity by poor drainage. Installation soils have been heavily influenced in many areas by human-related activities, including agriculture, cut-and-fill operations, fire, and general construction related activities.

A soil association is a landscape that has a distinctive pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern. Soil association information is suitable for general planning only, and is used to compare areas and certain kinds of land use.

Eight soil associations exist at Camp Ravenna and are described in (**Table 4**). The eight soil associations are: Chili, Fitchville-Haskins-Sebring, Loudonville-Mitiwanga-Dekalb, Mahoning-Ellsworth, Ravenna-Canfield, Remsen-Geeburg-Trumbull, Sebring-Holly-Canaedea, and Wadsworth-Rittman.

The eastern two-thirds of the property is Hiram Till, a 5 to 15 feet thick clay-rich, relatively impermeable till deposited as a ground moraine. Hiram Till generally falls in the Mahoning-Ellsworth soil association (Akron Metropolitan Area Transportation Study [AMATS], 1993). The western one-third of Camp Ravenna is Kent Till, a 20 to 40 feet thick silty-sandy till with a few cobbles and boulders deposited as a ground moraine. Kent Till generally falls in the Wadsworth-Rittman soil association. In addition to the glacially-formed soils, recent alluvium is present in the Lower Sand Creek area and in the Eagle Creek/Sand Creek confluence area, which is considered the Sebring-Holly-Caneadea association. Additional outwash sand and gravel is present in the elevated area in the northeastern corner of the installation (NRCS, 1992, 1978).

Chemical analyses conducted for the previous agricultural activities on the installation indicate the following chemical makeup of typical unimproved grounds:

- pH Range: 6.1 to 6.3
- Phosphorus (P): 44 to 58 lbs./acre
- Potassium (K): 128 to 152 lbs./acre
- Calcium (Ca): 1850 to 2530 lbs./acre
- Magnesium (Mg): 228 to 327 lbs./acre
- Cation Exchange Capacity: 8 to 12

TABLE 4 – SOIL ASSOCIATION DESCRIPTIONS FOR CAMP RAVENNA

SOIL ASSOCIATIONS	COUNTY	DESCRIPTION
Chili	P	Nearly level to very steep, well drained and somewhat poorly drained soils formed in coarse textured and moderately coarse textured glacial outwash
Fitchville-Haskins-Sebring	T	Nearly level and gently sloping, somewhat poorly drained and poorly drained soils formed in medium textured and moderately fine textured lacustrine material and medium textured to coarse textured glacial outwash over moderately fine textured and fine textured glacial till or lacustrine material
Loudonville-Mitiwanga-Dekalb	P	Nearly level to moderately steep, well drained and somewhat poorly drained soils formed in moderately fine textured to moderately coarse textured glacial till
Mahoning-Ellsworth	P/T	Nearly level to very steep, somewhat poorly drained and moderately well drained soils formed in moderately fine textured glacial till
Ravenna-Canfield	P	Nearly level to sloping, somewhat poorly drained and moderately well drained soils formed in medium textured and moderately coarse textured glacial till
Remsen-Geeburg-Trumbull	P	Nearly level to sloping, somewhat poorly drained and moderately well drained soils formed in fine textured glacial till
Sebring-Holly-Canaedea	P	Nearly level to gently sloping , poorly drained, and somewhat poorly drained soils that formed in lacustrine material in post-glacial lake basins and in alluvial material on floodplains.
Wadsworth-Rittman	P	Nearly level to sloping, somewhat poorly drained and moderately well drained soils that formed in medium textured and moderately fine textured glacial till
Sources: NRCS, 1992, 1978 COUNTY: P = Portage; T = Trumbull		

Soils that have profiles that are almost alike make up a soil series. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement (NRCS, 1992). A total of 37 soils series, comprising of 71 soil map units, are delineated within the 21,683-acre Camp Ravenna property (see **Figure 5**).

This installation has very little difficulty with erosion control. Generally, slope on the installation is five percent or less. Most areas have a slope of 2 percent or less. Erosion problems are man-made when altering original surface grade, or from bare earth maintenance under the perimeter fence. Problem areas are few and localized. Currently, there are no problem areas caused by mission activities beyond the scope of routine maintenance.

The majority of Camp Ravenna soils are thin, heavy-textured, seasonally wet, and limited in productivity by poor drainage. However, some areas have small pockets of productive soils, characterized by favorable drainage, water capacity, texture, and pH. These areas include the Canfield, Chili, Dekalb, Geeburg, Oshtemo, Lakin, Loudonville, Rittman, and Tioga soils.

For additional information pertaining to Camp Ravenna hydric soils, prime farmland, soil hydrology, woodland management and soil limitations consult the USGS Web Soil Survey or the *Soils Planning Level Survey for Ravenna Training and Logistics Site* (AMEC, 2006a). A copy of this report is on file in the Camp Ravenna Environmental Office.

3.4 HYDROLOGY

Ohio is a state with a wealth of water resources. These include 23,000 square miles of named and designated rivers and streams, a 451 mile border on the Ohio River, more than 118,800 acres of lakes, and about 230 miles of Lake Erie shoreline (OEPA, 2004). Camp Ravenna is located within the Mahoning River Watershed, which is comprised of eight Water Assessment Units (WAU) that cover less than one percent (approximately 290 square miles) of the State of Ohio and includes portions of five counties. Camp Ravenna is located within two of the eight WAUs, which include USGS Hydrologic Unit Codes (HUC) 05030103-030 and 05030103-040.

3.4.1 SURFACE WATER

Surface water features within Camp Ravenna include streams, lakes, ponds, floodplains, and wetlands. These water features are illustrated on **Figure 6**. For additional information pertaining to surface water and wetland features consult the the *USGS Watershed Inventory and Management Strategies, Ravenna Training and Logistics Site, Ohio* (USGS, 2002), the *Surface Waters Planning Level Survey for Camp Ravenna Joint Military Training Center* (OHARNG, 2013), the *Wetlands Planning Level Survey for Camp Ravenna Joint Military Training Center* (OHARNG, 2013)), and the RVAAP Facility-Wide Biological and Water Quality Study (USACE, 2003). A copy of these reports is on file in the Camp Ravenna Environmental Office.

3.4.1.1 STREAMS

Numerous streams drain Camp Ravenna, including approximately 19 miles of perennial streams. The total combined stream length at Camp Ravenna is approximately 212 linear miles, while average stream width is approximately three feet and average stream depth ranges from one to two feet (USGS, 2002; USAERDC – WES, 1999).

Three major streams (South Fork Eagle Creek, Sand Creek, and Hinkley Creek) drain approximately 65 percent of the facility. The northern and central portions of the property are drained by Sand Creek, with a total drainage area of 13.5 square miles (8,640 acres). Sand Creek subsequently drains to South Fork Eagle Creek, which has a drainage area of 30.7 square miles (19,648 acres) and runs into Eagle Creek and finally the Mahoning River. The western portions of Camp Ravenna drain to Hinkley Creek, a 7.2 square mile (4,608 acres) drainage basin, and subsequently to the West Branch of the Mahoning River. The eastern-most portion of the installation drains to the West Branch of the Mahoning River near its confluence with the main trunk of the Mahoning River. The southern areas drain directly into Michael J. Kirwin Reservoir. A number of smaller, unnamed creeks drain other areas of the facility (USGS, 2002).

Streams throughout Camp Ravenna are generally dominated by sand, fine gravel, and small cobble substrates. However, bedrock-bottomed pools and riffles and runs of bedrock rubble were also found in South Fork Eagle Creek, Sand Creek, and Hinkley Creek. The larger stream sites typically had the sandy substrates and low gradients, and cobbles and slabs dominated the substrates (ODNR-DNAP, 1999).

South Fork Eagle Creek, Sand Creek, and Hinkley Creek are designated as warm-water habitats (WWH) in the Ohio WQS. WWH is defined by the OEPA (1987) as:

> "Waters capable of supporting balanced, reproducing populations of warm-water fish, associated vertebrates, invertebrates, and plants on an annual basis. WWH is the Most widely applied of the aquatic life use designations; it is applied to those waters that either demonstrate biological attainment at a sufficient number of sites or provide adequate for supporting the use. A QHEI value that exceeds the ecoregion 25th percentile value demonstrates the capability to support WWH."

South Fork Eagle Creek and its tributaries, including Sand Creek, are also designated by the OEPA as State Resource Waters (SRW). State Resource Waters include water bodies which lie within park systems, wetlands, wildlife areas, and wild, scenic and recreational rivers, and publicly owned lakes, and waters of exceptional recreational or ecological significance. In 1978, the State Resource Water designation was redefined to include four levels of high-quality water: (1) General High-Quality Water, (2) Superior High-Quality Water, (3) State Resource Water, and (4) Outstanding national Resource Water. In 2003 many SRW were redesignated by the Ohio EPA as Superior High Quality Waters (SHQW) and Outstanding State Waters (OSW). South Fork Eagle Creek was redesignated as a SHQW because of the endangered mountain brook lamprey (*Ichthyomyzon greeleyi*) collected there in 1987 and 1999, 2003, and 2010. Mountain brook lamprey were also captured in Sand Creek in 2003 and 2010 (USACE, 2005; USGS, 2002, Hoggarth and Rice 2011) but Sand Creek retained it's designation as a SRW and was not redesignated as a SHQW.

Ohio EPA antidegradation rules protect SHQW and OSW from lowering of existing water quality, and permitted pollutant loadings are less than what are permitted for other use designations in Ohio. These waters are protected from any action that would degrade the existing water quality. Actions that degrade the existing water quality in these creeks are closely regulated via standards and rules imposed in Ohio Administrative Code (OAC) Chapter 3745-1. South Fork Eagle Creek, as a SHQW falls under the stricter Ohio EPA antidegradation rules. Sand Creek and Hinkley Creek do not fall under the same antidegradation rules as South Fork Eagle Creek.

3.4.1.2 PONDS AND BEAVER IMPOUNDMENTS

Approximately 282 acres of ponds are found on the facility. The major ponds are summarized in **Table 5**. Additional information on the historical site usage associated with these ponds can be found in Part II of the *Facility-Wide Biological and Water Quality Study 2003 Ravenna Army Ammunition Plant* prepared by the USACE in cooperation with the OEPA (USACE, 2005).

Many of the ponds are shallow and in advanced eutrophic states, but 22 or so are deep enough to support a warm water fishery. Most of the ponds were created by beaver (*Castor canadensis*) dams or small man-made dams and embankments. A few of the ponds were originally used as settling ponds during load line production and are undergoing investigation and clean up when determined necessary. Beaver dam and lodge locations are depicted in **Figure 6**. In the recent past the OHARNG has constructed several sedimentation ponds to catch runoff from tank trails and protect surface water quality on the Gunnery Table IV Range in TA B. The OHARNG also built a sedimentation pond between the two target tracks on this range when the track beds where being built and have converted it into permanent pond that supports a warm water fishery. The borrow site northwest of the target tracks has also filled with water and is being left as a pond.

These ponds generally provide valuable wildlife habitat. Current wildlife management consists of wood duck (*Aix sponsa*) box placement and dam maintenance on selected ponds. Dam and water control device maintenance has been neglected and on several ponds the dams are in jeopardy of breaking, the pond is dry, or the ability to control water is lost. Some of the more accessible areas are used for fishing and hunting. The ponds support wood ducks, hooded mergansers (*Lophodytes cucullatus*), mallards (*Anas platyrhynchos*), Canada geese (*Branta canadensis*), and many other birds and wildlife species. Some ponds have been stocked with game fish in the past. Almost all the ponds contain fish, except for some of the shallow hatchery ponds and new shallow beaver ponds.

3.4.1.3 FLOODPLAINS

Floodplains generally are areas of low, level ground present on one or both sides of a stream channel that are subject to either periodic or infrequent inundation by flood waters. Floodplains are typically the result of lateral erosion and deposition that occurs as a river valley is widened. High water tables and flooding are associated with floodplains. Inundation dangers associated with floodplains have prompted federal, state, and local legislation limiting the development in these areas to recreation, agriculture, and preservation activities. Floodplains are regulated by the Federal Emergency Management Agency (FEMA) with standards outlined in 44 CFR Part 60.3.

EO 11988, *Floodplain Management*, requires agencies to assess the effects that their actions may have on floodplains and to consider alternatives to avoid adverse effects and incompatible development on floodplains. One-hundred-year floodplain areas are shown on **Figure 6**, and are associated with Hinkley Creek and its tributaries, lower portions of Sand Creek and its tributaries, and South Fork Eagle Creek and its tributaries (including Sand Creek). An area of approximately 185 acres near the confluence of Sand Creek and South Fork Eagle Creek also is considered to be within the 100-year floodplain. Additional 100-year floodplain areas exist along the southern boundary of Camp Ravenna within unnamed Mahoning River tributary drainages (FEMA, 1987, 1978).

TABLE 5: PONDS AT CAMP RAVENNA			
POND NAME	APPROXIMATE SIZE (ACRES)	ORIGIN	DESCRIPTION
Water Works	0.5 0.5 1.3	Man-made	These three connecting ponds were used as outwash ponds when the water treatment plant was operational. The ponds are built in an old quarry that was used for munitions and other burning operations up to 1976. These ponds are part of AOC RVAAP-16. The ponds were built in 1976 and historically used as fishing ponds. All three contain fish but the northern pond is shallow and the fish population in it fluctuates greatly from year to year. Up until the early 1990s rainbow trout (*Oncorhynchus mykiss*) were annually stocked in the southern most pond as a put and take program. That practice has been discontinued. Fishing is currently not permitted while the ponds are undergoing environmental remediation.
Frank's	2.0	Man-made	This pond contains a warm water fishery. It is not part of the restoration program and is open to fishing with no special land use restrictions as a result of restoration activity. There are three wood duck boxes on this pond.
Trout (Route 80)	1.6	Man-made	This pond used to be stocked annually with rainbow trout as a put and take program. That practice has been discontinued. It supports largemouth bass (*Micropterus salmoides*) population and other warm water fish. The pond is surface water and spring water fed. This pond is not part of the restoration program and is open to fishing with no special land use restrictions due to restoration activity.
Mack's	1.7	Man-made	In an isolated area adjacent to burning grounds, this pond is not accessible to fishing or other regular human activity. The pond was built as a source of water for fire fighting. Mostly green sunfish (*Lepomis cyanellus*) are present. The pond is not directly part of the restoration program, but it is within the area of the Winklepeck Burning Grounds (RVAAP-5) and Open Demolition Area #2 (RVAAP-4), and is therefore restricted access. The earth dam failed in 2010 and the pond is mostly dry at this time.
Old Quarry	3.6	Quarry	This pond was created when an old sandstone quarry filled with water. The pond overflows into the Wadsworth Glen and South Fork Eagle Creek. The pond supports a warm water fishery and is open to fishing, but difficult to access due to overgrown vegetation. The pond is not part of the restoration program and is open to fishing with no special land use restrictions as a result of restoration activity.
Boy Scout	3.5	Man-made	This pond in the Wadsworth Glen as the result of a concrete dam across South Fork Eagle Creek just west of Wadsworth Road. The dam is in poor condition. The wing walls are being undercut as spring time floods overflow the dam. There are no funds or plans to repair the dam. There are plans to remove the dam in 2014/15 to restore the stream for stream mitigation associated with a wetland fill permit. The pond is not part of the restoration program and is open to fishing with no special land use restrictions as a result of restoration activity. This pond used to be stocked annually with rainbow trout as a put and take program. That practice has been discontinued. The pond supports a warm water fishery. This pond filled with a lot of silt during the construction of the ammunition plant. It was drained in the early 1980's and some of the silt excavated and placed in adjacent uplands. Funding ran out with the majority of the silt still in the pond.
North Patrol	2.4	Man-made	This pond at the western mouth of the Wadsworth Glen is the result of a concrete spillway at the mouth of the Glen. This pond was a primary catch basin for erosion during construction of the ammunition plant. Silt that made it through this pond ended up downstream in the Boy Scout Pond. The pond supports a warm water fishery. The sediments in the pond are very deep and the pond supports a diverse aquatic flora. The pond is not part of the restoration program and is open to fishing with no special land use restrictions as a result of restoration activity.

TABLE 5: PONDS AT CAMP RAVENNA			
POND NAME	APPROXIMATE SIZE (ACRES)	ORIGIN	DESCRIPTION
Big and Little Cobb's	9.2 6.1	Man-made	These ponds were built as Trinitrotoluene (TNT) settling ponds for Load Line 3 and Load Line 12 operations. They support a warm water fishery. Restricted catch and release shore fishing is currently allowed in these ponds. The ponds are undergoing environmental remediation (RVAAP-29). Big Cobb's Pond has an adjacent play ground and picnic area used by Camp Ravenna employees and guests for picnics and cook-outs. A catch and release restriction is in place because human health risk analysis for fish tissue showed an unacceptable risk for comsumming fish.
Ed's	5.4	Man-made	This pond is adjacent to the old hay field – now the North Dig Site. It supports a warm water fishery. Access is difficult. There is adjacent beaver activity, which has turned the surrounding area into a large wetland complex. The pond is not part of the restoration program and is open to fishing with no special land use restrictions as a result of restoration activity.
Kelly's	1.2	Man-made	This small stream impoundment/settling pond has a similar contamination history to Cobb's Ponds. Part of the Load Line 2 AOC (RVAAP-9). Small and relatively deep, this pond is more suitable for fisheries than waterfowl management. Restricted catch and release shore fishing is currently allowed in this pond. The pond is undergoing environmental remediation.
Snow Road	6.4	Man-made	This pond was created by an earth embankment across a small tributary of South Fork Eagle Creek. The water control structure has failed and the water level is controlled by beaver. The pond supports a warm water fishery and a diverse aquatic flora. The pond is not part of the restoration program and is open to fishing with no special land use restrictions from restoration activity.
Criggy's	5.3	Man-made	This very shallow fishless pond supports populations of turtles and frogs. Primary value is wildlife habitat. Part of settling pond system for Load Line 1 (RVAAP-8). Restricted catch and release shore fishing is currently allowed for those interested in trying to fish in this pond. The pond is undergoing environmental remediation.
Load Line 2	0.8 1.0 1.3	Man-made	These three ponds are at the northeast corner of Load Line 2, just outside of the load line fence and west of Load Line 1. They are the result of borrow areas excavated for fill to build up the railroad bed that accesses Load Line 2. Two of the ponds support a warm water fishery; the third is too shallow to sustain a fish population. The ponds are not part of the restoration program and are open to fishing with no special land use restrictions as a result of restoration activity.
Smalley-Slagle	3.6	Beaver-made	This beaver flooding on tributary of South Fork Eagle Creek has excellent waterfowl habitat. This pond is a series of two beaver ponds that support a warm water fishery. The pond is not part of the restoration program and is open to fishing with no special land use restrictions as a result of restoration activity. Access is difficult and the fishery is dependent upon water level and beaver activity.
Bundling Road	6.9	Beaver-made	This pond was created more than twenty years ago by beaver flooding. Considerable waterfowl use observed, particularly during fall migration. The pond has been a productive hunting spot. Supports a warm water fishery. The pond is not part of the restoration program and is open to fishing with no special land use restrictions as a result of restoration activity.
Big And Little Paul's	2.3 1.0	Man-made	These ponds were former wet areas along small drainage, impounded with man-made embankments. These ponds are prone to winter kill when the snow cover is heavy. There is extensive beaver flooding adjacent along the northern boundary of these ponds. Wood ducks are plentiful. The ponds historically supported a warm water fishery but have gone eutrophic and are mostly shallow wetland at the current time. The ponds are not part of the restoration program and are open to fishing with no special land use restrictions as a result of restoration activity.

TABLE 5: PONDS AT CAMP RAVENNA			
POND NAME	APPROXIMATE SIZE (ACRES)	ORIGIN	DESCRIPTION
Hatchery	0.4 0.5 0.6 0.6 0.7	Man-made	These small woodland impoundments were constructed as private hatchery ponds pre-1940. The original water source was water diversion from an adjacent Hinkley Creek tributary. The lower three ponds are dry from control structure failure. The upper two ponds hold water and support fish. The ponds are not part of the restoration program and are open to fishing with no special land use restrictions as a result of restoration activity.
South Service	1.8	Man-made	This pond is almost drained as a result of a spillway failure. When full it supports a warm water fishery. An attempt was made to fix the spillway in 2001, but failed. The dam and spillway are in need of rehabilitation. The pond has a large area of shallow back water, which supports an overabundance of spatterdock. This pond is not part of the restoration program and is open to fishing with no special land use restrictions due to restoration activity. When full the pond is approximately 11.2 acres. It currently has a surface water area of only 1.768 acres.
A-Block Quarry	0.6 1.0 1.4	Quarry	Three shallow ponds formed in the bottom of old sandstone quarries mined during the construction of the ammunition plant. They are too shallow to support fisheries but do support reptiles, amphibians, and Odonata populations. These ponds are habitat to for one of the largest known populations of the Northern Bluet damselfly. The ponds are not part of the environmental restoration program.
Demolition Road	13.8	Beaver-made	This is a seasonally shallow beaver pond. In 1993 the USFWS built an earthen dike to make the wetland more stable. The USFWS dike failed within two years and beaver have since moved in and the water level continues to fluctuate. The pond does not support a fishery, but does provide good wildlife habitat. A pair of Sandhill Cranes was observed flying from this pond in the summer 2006 and was thought to have been nesting. This pond is not part of the environmental restoration program.
Load Line 4	2.7	Man-made	This pond was originally built as a settling pond for outwash from Load Line 4. Beaver frequent the pond and manipulate the water level from time to time. The pond supports a warm water fishery. This pond is included in the environmental restoration program. Catch and release shore fishing is permitted but since the pond is located within the load line access is restricted.
Daugherty's (Wetland Site 1)	4.2	Man-made	This pond was constructed by the 216th Engineers as a wetland mitigation project. The primary function of the pond is as a wetland and the pond and surrounding upland must be retained in perpetuity as a wetland mitigation site. The pond was vegetated with wetland plants and seed. It is designed to have a large amount of shallow backwater. The pond and basin provided 5.0 acres of onsite wetland enhancement credit. The portion by the dam is deep enough to support fish. No fish have been stocked and none are planned. Inevitably fish will likely populate the pond through natural processes. This pond is not part of the restoration program and is open to fishing with no special land use restrictions due to restoration activity.
Morgan's (Wetland Site 2)	0.7	Man-made	This abandoned beaver pond was rehabilitated by constructing an earthen dike with a spill pipe. The pond was constructed as a wetland mitigation project and must be retained in perpetuity as a wetland mitigation site. The pond and associated wetland provided a total of 6.6 acres of onsite wetland enhancement credit. It is too shallow to support a fishery and functions as a wetland and wildlife habitat. The pond is not part of the restoration program and access and land use is not restricted.
Gordon's	0.4	Man-made	This is a man-made dug pond on the perimeter road on the NE perimenter. It supports a warm water fishery and has two wood duck boxes on it. Local residents tend to use the wood duck boxes for target practice, shooting at them from the railroad tracks just north of the perimeter fence.

TABLE 5: PONDS AT CAMP RAVENNA			
POND NAME	APPROXIMATE SIZE (ACRES)	ORIGIN	DESCRIPTION
North Line Beaver Pond	3.9	Beaver-made	This beaver pond was formed in 1993/94. The site previously contained burr oak, swamp white oak and pin oak. For several years is supported a range heron rookery until the trees deteriorated. The pond is still good wildlife habitat. It is not known to support a fishery.
Tank Range Mitigation Pond	1.5	Man-made	This pond that was constructed as a storm water control pond during construction of the tank range target track berms. The excavated fill was used to construct the berms. The pond was abandoned as a storm water control pond and converted into to a wetland mitigation site for wetland filled when the new UTES was built in 2000. The pond is designated as a wetland mitigation site and protected from change in land use. The pond does support a warm water fishery.
Tank Range Borrow Site Pond	2.1	Man-made	This pond was created at a borrow site. Fill was excavated and used to construct the tank range target track berms. The borrow site has not been exhausted. The pond is shallow and known to support amphibians. It is not known to support a fishery.
Beaver	176.8	Beaver-made	Many beaver floodings of various sizes provide the most important wetland wildlife habitat at Camp Ravenna. Some support fish. They are generally not managed except for limited beaver trapping and control of water level and placement of wood duck boxes. Several are high quality for waterfowl and several are productive for waterfowl hunting and fishing.
Source: OHARNG, 2013			

3.4.1.4 WETLANDS

The USACE and the USEPA define wetlands as:

"Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

Both Federal and State laws and regulations protect waters of the state, which includes wetlands. The Clean Water Act (CWA) is the primary law protecting US waters. Section 404 of the CWA (33 USC 1344) prevents the discharge of dredged or fill material into waters of the US without a permit from the USACE. Generally, whenever a Section 404 permit is required, a Section 401 Water Quality Certification (WQC) issued by the State of Ohio is also required.

EO 11990, Protection of Wetlands, requires Federal agencies to take action to minimize the destruction, loss or degradation of wetlands, and to conserve and enhance the beneficial values of wetlands.

A total of two PLS and fourteen jurisdictional delineations have been conducted at Camp Ravenna to date (see **Figure 7**). **Table 6** provides an overall summary of wetland survey and inventory reports for Camp Ravenna. For information specific to particular wetland surveys listed in Table 6 consult the *Wetlands Planning Level Survey for Camp Ravenna Joint Military Training Center* (OHARNG, 2013) or the specific wetland delineation report. A copy of the Wetland PLS and various individual wetland delineation reports are on file in the Camp Ravenna Environmental Office.

TABLE 6: SUMMARY OF ALL WETLAND SURVEYS AND INVENTORIES FOR CAMP RAVENNA

INVENTORY/SURVEY				SURVEY AREA (ACRES)	WETLANDS (ACRES)	STREAMS (MILES)
TYPE	AUTHOR	DATE	DESCRIPTION			
NWI Inventory	USGS	1977	Installation-wide	21,683	2,245	-
Planning Level Survey	USGS	1997	TAs A through H and J	3,330	1,281	-
	USAERDC - WES	1999	Installation-wide	21,683	1,974	212
Jurisdictional Wetland	Science and Engineering Associates	1999	910th Proposed Runway	215	158	-
	SAIC	2000	UTES, triple culvert/road widening, and pump station	18.4	6.05	-
		2002	New ATC	12	1.84	-
		2004	Several Proposed Development Areas	2,584	207.92	16.6
	ASC Group, Inc.	2006	MK-19 Range	440	9.57	-
	EnviroScience, Inc.	2006	Engineer Training School	390	19.81	2.88
	Davey Resource Group	2008	Route 80 Engineering Site	294.54	53.726	0.96
	Davey Resource Group	2008	Range Development Plan	721.3	98.585	6.01
	EnviroScience, Inc.	2008	Remediation Action Areas	43	5.536	0.48
	EnviroScience, Inc.	2010	Group 2 Tactical Training Base	120	5.47	0.45
	Davey Resource Group	2010	Mechanized Record Fire Range Project	102.6	11.67	0.86
	Lawhon and Associates, Inc.	2012	Dig Site North & Heavy Maneuver Area	109.7	6.577	-
	Wilcox	2012	McKibbon Road Connector	120	67.31	-
	Davey Resource Group	2012	Multipurpose Machine Gun (MPMG) Range and Combat Pistol Qualification Course (CPQC)	509	63.074	4.93
Total Wetlands and Other Waters				**5,679.54**	**715**	**33.16**

* Refer to this section in the document for a summary of the original wetland report.

PLS have been conducted installation-wide (USAERDC-WES, 1999) and specifically within the training areas (USGS, 1997). PLS are typically used for large areas of land for intial screening and general planning to identify potential wet areas where the USACE might require a CWA Section 404 permit prior to construction, filling, or pursuit of other regulated activities. A wetland PLS is not a jurisdictional, isolated wetland or other regulated waters delineation. Prior to construction, filling, or other regulated activities within the identified water, the USACE Pittsburgh District will still require the completion of a jurisdictional delineation.

Detailed jurisdictional wetland delineations are needed as part of the planning and design process for most projects. Such projects could include land grading, off road vehicle maneuver, construction of ranges, training venues, roads, buildings and other appurtenant structures, or activities as simple as culvert crossings of small intermittent streams, rip-rap placement in stream channels to curb accelerated erosion, and incidental fill and grading of wet depressions. Jurisdictional delineation must also identifiy and map isolated wetlands, regulated by the State of Ohio, and other regulated waters (streams). The quality of all identified wetlands and other waters must also be scored using the Ohio Rapid Assessment Method (ORAM) and applicable stream quality model. Previous jurisdictional wetland delineations have surveyed approximately 5,680 acres or 26 percent of the Camp Ravenna land. Approximately 715 acres of jurisdictional wetlands have been delineated within the 5,680 acres, which comprises approximately 13 percent of the total surveyed area.

In addition to the wetland surveys, previous vegetation community surveys have identified and characterized wetlands at Camp Ravenna. Twelve of the 18 vegetation communities identified by the ODNR - DNAP in 1993 are considered wetland communities (ODNR, 1993). These communities were characterized according to the Anderson's classification system (Anderson, 1982) and include.

- Submergent Marsh
- Floating-leaved Marsh
- Mixed Emergent Marsh
- Cat-tail Marsh
- Sedge-grass Meadow
- Mixed Shrub Swamp
- Button Bush Swamp
- Oak-Maple Swamp Forest
- Mixed Swamp Forest
- Mixed Floodplain Forest
- Wet Fields
- Red Maple Woods

In addition, subsequent identification and mapping of the Camp Ravenna plant communities was done in 1999 using the Federal Geographic Data Committee (FGDC) standards for plant community identification (SAIC, 1999). Plant communities with wetland characteristics identified in this survey include:

- *Acer rubrum* successional forest
- *Fraxinus pennsylvanica - Ulmus americana - Celtis occidentalis* Temporarily Flooded Forest Alliance
- *Salix nigra* Temporarily Flooded Forest Alliance
- *Acer rubrum - Fraxinus pennsylvanica* Seasonally Flooded Forest Alliance
- *Quercus palustris - Quercus bicolor* Seasonally Flooded Forest Alliance
- Intermittently flooded mid-successional cold-deciduous shrubland
- Intermittently flooded late-successional cold-deciduous shrubland
- *Cephalanthus occidentalis* Semipermanently Flooded Shrubland Alliance
- *Cornus* spp. - *Salix* spp. Saturated Shrubland Alliance
- *Phalaris arundinacea* Seasonally Flooded Herbaceous Alliance
- *Typha* spp. - (*Scirpus* spp. - *Juncus* spp.) Seasonally Flooded Herbaceous Alliance
- *Typha* (*angustifolia*, *latifolia*) - (*Scirpus* spp.) Semipermanently Flooded Herbaceous Alliance
- Intermittently flooded early successional herbaceous field
- *Nuphar lutea - Nymphaea odorata* Permanently Flooded Herbaceous Alliance
- *Potamogeton* spp. - *Ceratophyllum* spp. - *Elodea* spp. Permanently Flooded Herbaceous Alliance

For greater detail pertaining to Camp Ravenna vegetation community types refer to **Section 4.2**.

3.4.1.5 WETLANDS MITIGATION SITES

Wetland fill permits that require wetland mitigation usually require a deed restriction, conservation easement or some other form of a restrictive covenant that ensures the wetland mitigation site will remain a wetland in perpetuity. Such restrictive covenants are not permited on non-excess federal property (GSA, 1998; Randy Chamber, Chief, Environmental Law, NGB, 2012). This creates a challenge in complying with wetland permits that specify a restrictive covenant is required for wetland mitigation sites on the Camp Ravenna property.

As an alternative to restrictive covenetants for on-site wetland mitigation areas, the OHARNG has identified the on-site wetland mitigation areas in this section of the Camp Ravenna INRMP and in the Camp Ravenna Master Plan. Doing so officially identifies these mitigation sites and designates their land use as wetland mitigation. The land use of wetland mitigation sites may not be altered to another use without formal coordination with and concurrence of the USACE and/or the Ohio EPA as applicable. Altering a wetland mitigation site to another use may require a permit and/or compensatory wetland mitigation. The wetland mitigation sites must be managed and maintained in accordance with permit mitigation plan specifications.

If the mitigation sites are ever excessed by the federal government, then a restrictive covenant in accordance with the applicable wetland permit requirements. Any such covenant must comply with applicable Ohio law.

The below **Table 7** identifies the current wetland mitigation sites on the Camp Ravenna Property along with wetland permit information. A map of these areas is provided as Figure 7.

TABLE 7: MITIGATION SITES OF CAMP RAVENNA

PERMIT NUMBER	PERMIT DATE	DESCRIPTION	MITIGATION REQUIREMENTS/GOAL	MITIGATION DESCRIPTION
USACE 199700503; Ohio EPA 062806	15 Mar 1999; 16 Dec 1998	After the fact permit to fill 3 acres of isolated wetland for the Armory and Barracks parking lot in Cantonment Area 3.	Requirement: On site 6 acres of on-site wetland enhancement and 3 acres of off-site wetland restoration. Goal: Construct Site 1 (Daugherty's Pond) for 4.5 acres and Site 2 (Morgan's Pond) for 2.2 acres of on-site wetland enhancement. Construct Site 3 (Berlin State Wildlife Management Area) for 3 acres off-site wetland restoration.	All constructed in 1999 and 2000. Daugherty's Pond - 5.0 acres of on-site wetland enhancement. Morgan's Pond - 6.6 acres of on-site wetland enhancement. Berlin State Wildlife Management Area - 6.826 acres off-site wetland restoration. Exceeded goal by 8.726 acres.
USACE 200001401	6-Sep-00	Authorization under NWP 39 for the new UTES to impact 0.092 acres.	Requirement: 0.3 acres of on-site wetland replacement. Goal: Convert borrow site/storm water retention pond between target berms on Gunnery Table III Range into mitigation, approx.5 acres.	Constructed in 2001. Approx .5 acres with and adjacent grassland buffer.
Ohio EPA 083389	10-Sep-08	Fill 0.5 acres of Category 1 and 2 isolated wetlands for the RTI Group 2 South Dig Site.	Requirement: On site creation of 0.915 acres of wetland. Goal: Create 0.915 acres of category 2 or better wetlands at the old Route 80 Tank Farm in conjunction with BRAC storage tank removal and site restoration.	Constructed in 2007. Created 3.137 acres with a modified category 2 score as of 2011. Exceeded goal by 2.222 acres.

3.4.2 GROUND WATER

The sandstone units of the Pottsville formation are the major aquifers in the region. These aquifers exist under artesian conditions, and are typically confined by glacial drift or shale. Within this formation, the Sharon Conglomerate is the most productive of these units, and is the major bedrock aquifer in northeastern Ohio. The study performed by Kammer (1982) indicated that of the 71 groundwater wells which penetrated the installation at that time, 57 were penetrating the Sharon Conglomerate. Data from the Kammer study indicated that the thickness of the Sharon Conglomerate ranges from 44 to 177 feet, while the average well depth at Camp Ravenna is approximately 155 feet, with a range between 83 and 261 feet (Kammer, 1982).

Groundwater flow at Camp Ravenna is generally from west to east. Throughout the facility, average depth to ground water is as deep as 50 feet below ground surface (bgs), with static water levels occurring between 958 and 1,184 feet AMSL (Kammer, 1982). However, ground water has been encountered at much shallower depths in the upper unconsolidated aquifer across the property. Groundwater flows from bedrock highs in the western portion of the property toward stream valleys in the eastern portion; these latter areas act as discharge areas, as indicated by static water levels in monitoring wells across the installation (Kammer, 1982).

In the region of Camp Ravenna, groundwater recharge occurs via surface streams and surface infiltration through sand and gravel within buried valleys. Two large buried valleys occur southwest and northwest of the facility, and can yield up to 1,600 gallons per minute of ground water from wells penetrating those particular glacial tills. The majority of the property itself, however, is comprised of clay-rich glacial tills with low permeabilities and underlying bedrock formations with extremely variable, but relatively low permeabilities. Typical yields from wells penetrating the Sharon Conglomerate range from five to 200 gallons per minute; yields from the overlying unconsolidated sediments are usually considerably lower. In addition, the thickness and permeability of the bedrock formation/unit producing the water at Camp Ravenna vary considerably and have a strong effect on well yields, transmissivity, and hydraulic conductivity (Kammer, 1982). Records (well logs) on file at the ODNR, Division of Water indicate that over 3,000 water wells exist with the Mahoning River Basin.

The OHARNG Cantonment Area 3 facilities utilize Newton Falls City water and wastewater lines. The TTB has potable water and sanitary sewer service from the Village of Windham. These lines are currently being extended down Paris-Windham road to Cantonment Area 1 at the Main Gate as funding is available.

Ground water development and use is limited at Camp Ravenna due to the environmental restoration program and clean up of the munitions manufacturing and treatment facilities. Ground water issues have not yet been fully assessed. It is expected that ground water will be available for use in most areas. Well development and groundwater use is currently evaluated and reviewed in coordination with the USACE and the Ohio EPA on a case by case basis to ensure there are no conflicts with the environmental restoration program.

Groundwater within the Camp Ravenna area is hard and typically contains high concentrations of iron and manganese (Ogden Environmental and Energy Services, 2000).

During past munitions production operations, groundwater was obtained from on-site production wells. The majority of these wells and the residential wells in the vicinity of Camp Ravenna are screened in the Sharon Conglomerate as this is the major producing aquifer in the area. Production wells scattered throughout the facility provided necessary sanitary and process water for past munitions production operations. The open potable water production wells were permanently abandoned in 1992.

In 1993 two groundwater production wells were developed in Cantonment Area 1. The OHARNG developed two additional wells in Cantonment Are 1 in 2011. One well is west of the former building 1039 and provides potable water to buildings 1037, 1038, and the Post 1 Guard Shack. The second well is west of building 1034 and east of George Road and provides potable water to building 1034. The third well is just north of Cantonment Area 1 off the west side of George Road and services building

1067. The forth well is south east of building 1068 and services building 1068. The well west of building 1039 was at one time a nontransient noncommunity water system that required an on-site licensed operator with a Limited A certification to operate. Currently all the wells service less than 25 people and are classified as private water systems and do not require a licensed operator.

Several old construction era and pre-construction homestead wells scattered throughout Camp Ravenna are still open. Most of these are being closed as part of the IRP in FY14. Funding must be programmed and the remaining non-IRP related open wells must be closed by the OHARNG DIMR.

The *Ground Water Pollution Potential of Portage County* published by the ODNR (Angle, 1990) provides additional insight into the groundwater characteristics of the Camp Ravenna area. This map indicates the relative vulnerability of groundwater in a specific area to contamination from surface sources. Based on this mapping system, the majority of the RVAAP facility has a moderate pollution potential that ranges between 100 and 159 (maximum of 200), depending on location. However, the higher ranges are observed primarily in the northeast portion of the facility within areas where alluvium overlies bedded sedimentary rock (140 to 159).

SECTION 4: ECOSYSTEMS AND THE BIOTIC ENVIRONMENT

Camp Ravenna has a diverse range of vegetation and habitat resources. The majority of lands within Camp Ravenna are post-successional agricultural lands, with the exception of a few areas of large mature forest and areas that were considered too wet to farm. Approximately 90 percent of Camp Ravenna, with the exception of wet woods, had historically been cleared and used for agriculture or otherwise disturbed. Habitats currently present within the Camp Ravenna installation include large tracts of closed-canopy hardwood forest, scrub/shrub open areas, grasslands, wetlands, open-water ponds and lakes, and semi-improved administration areas.

4.1 ECOSYSTEM CLASSIFICATION

Camp Ravenna is located in the U.S. Ecoregion - Humid Temperate Domain - Hot Continental Division - Eastern Broadleaf Forest (Oceanic) Province - Erie/Ontario Drift and Lake Plain - Low Lime Drift Plain ecosystem land classification. The Low Lime Drift Plain ecoregion is characterized by a rolling landscape composed of low rounded hills with scattered end moraines and kettles (Bailey, 1994).

4.2 VEGETATION

4.2.1 HISTORIC VEGETATIVE COVER

Most plant communities at Camp Ravenna have developed within the past 65 years, subsequent to the purchase of the property by the Federal government in 1939 and 1940. Prior to 1939, the land was cleared and used for agricultural crops. The exact history of agricultural use after government purchase is not known. Many of the fields were leased for the production of row crops, forage, and hay. Records are not available, but it is believed that leasing began in the 1940s during the construction of the installation and was done during ammunition production periods up until the early 1970s.

The government harvested the available timber in the 1940s to supply lumber for construction of the installation. In the 1960s and 1970s, the installation conducted very large sanitation and improvement timber cuts to remove the remaining low grade timber and to improve the growing stock. Once most of the stands had received sanitation cuts, the management then changed to conventional types of harvesting with lower annual volumes being harvested. During the 1980s the installation invested heavily in TSI to remove invasive species that hinder forest growth and development. Camp Ravenna forests have now developed into diverse and healthy ecosystems with high quality hardwood timber. Although a few remnant patches of older trees remain throughout the installation, in general, the current stands of timber are entering mature classes ranging in age from 65 to 100 years. Most agricultural fields have now reverted to a mixture of shrub and forest plant communities. Camp Ravenna, once primarily agricultural land, is now mostly forested (OHARNG, 2001).

4.2.2 PLANT COMMUNITIES

Vegetated land at Camp Ravenna can be divided into three broad vegetation categories: herb-dominated, shrub-dominated, and tree-dominated. Tree-dominated areas are most widespread, covering approximately 13,220 acres of Camp Ravenna. Shrub vegetation dominates approximately 4,250 acres, and 3,170 acres exhibit predominantly herbaceous vegetation. The remaining acres at Camp Ravenna are not dominated by vegetation and include areas previously developed or disturbed through the emplacement of structures, roads, and and other development.

Vascular plant surveys of Camp Ravenna have been conducted by The Nature Conservancy, the Ohio DNR in 1993, 1998/99 and 2010, and periodically by Natural Resources Manager, Brian Riley, between 2012 and 2014. As of October 2014, vascular flora surveys have identified 983 taxa of vascular plants on the training site. No federally listed endangered, threatened, or candidate plant species have been identified at Camp Ravenna. A total of 17 state-listed species have been identified at Camp Ravenna see (**Table 14)**. A complete taxa list is provided in **Appendix D**.

Plant communities were defined using Anderson's Classification in 1993 (ODNR, 1993) and the Federal Geographic Data Committee (FGDC) vegetation classification standard in 1999 (SAIC, 1999).

Anderson's classification system is the only published system specific to Ohio (Anderson, 1982). A total of 18 plant communities, as shown in **Figure 8**, were identified within Camp Ravenna based on the Anderson's classification scheme for Ohio plant communities. These 18 vegetation communities are summarized in **Table 8**.

TABLE 8. SUMMARY OF ANDERSON VEGETATION COMMUNITY CLASSIFICATIONS

COMMUNITY TYPE		APPROXIMATE ACREAGE
Forest/Woodland Communities	Oak-Maple Swamp Forest Community	986.5
	Mixed Swamp Forest Community	1,705.8
	Mixed Floodplain Forest Community	186.6
	Beech-Sugar Maple Forest Community	2,315.6
	Hemlock (*Tsuga canadensis*)-White Pine (*Pinus strobus*)-Hardwood Forest Community	21.3
	Oak-Maple-Tuliptree Forest Community	2,587.3
	Oak-Hickory (*Carya* spp.) Forest Community	233.4
	Red Maple (*Acer rubrum*) Woods Community	4,162.5
	Ash (*Fraxinus* spp.) -Wild Black Cherry (*Prunus serotina*)-Red Maple Woods Community	1,426.5
Shrub/Herbaceous Communities	Sedge (*Carex* spp.)-Grass Meadow Community	55.5
	Mixed Shrub Swamp Community	470.1
	Buttonbush Shrub Swamp Community	36.8
	Wet Fields-Shrub Thickets	1,413.6
	Dry (Upland) Fields-Shrub Thickets	3,378.4
Marsh Communities	Submergent Marsh Community	31.3
	Floating-leaved Marsh Community	<0.1
	Mixed Emergent Marsh Community	20.7
	Cattail Marsh Community	238.6

The FGDC vegetation classification standard includes a hierarchy of five physiognomic levels and two floristic levels, and is the approved standard for vegetation classification on federal lands.

- ***Physiographic Levels:*** Physiognomic Class – Physiognomic Subclass – Physiognomic Group – Subgroup – Formation
- ***Floristic Levels:*** Alliance - Association

The FGDC system classifies plant communities in the physiognomic levels using the following core data:

- dominant life-form or vegetation stratum (i.e., tree, shrub, dwarf-shrub, herb, non-vascular)
- physiognomic attributes of the dominant vegetation stratum (e.g., evergreen, deciduous, etc.)
- hydrologic regime of the site (Cowardin et al., 1979)

The dominant life form is used to classify the plant community into one of the following seven classes: closed tree canopy (forests); open tree canopy (woodlands); shrubland; dwarf shrubland; herbaceous; non-vascular (bryophytes, lichens, and algae); and non-vegetated. Physiologic attributes and hydrologic

regime are used to classify the community to the remaining physiognomic levels. During Phase I, plant communities at Camp Ravenna were classified to the formation level.

In general, the formation name is intended to provide the physiognomic description of the community type. However, formation names do not contain more familiar descriptions of communities, such as dominant plant species. This type of description is reserved for alliance and association classification levels. As part of Phase II, alliance classifications were made and more detailed descriptions of plant community types were developed.

Camp Ravenna has a total of seven forest formations (includes six communities and eight alliances), four shrub formations (includes four communities and two alliances), eight herbaceous formations (includes five communities and five alliances), and one non-vegetated formation. FGDC Plant communities, as defined using the FGDC classification system, occurring at Camp Ravenna are shown in **Figure 9** and summarized in **Table 9**.

TABLE 9: SUMMARY OF THE CAMP RAVENNA FGDC VEGETATION FORMATIONS AND CORRESPONDING COMMUNITY OR ALLIANCE							
DOMINANT VEGETATION	FGDC CODE	FORMATION	COMMUNITY (C) OR ALLIANCE (A)	MAP CODE	ACRES	DESCRIPTION	DOMINANT SPECIES
Forest Formation	I.A.8.C.a.	Plantations (planted timber stands, Christmas trees)	*Pinus strobus* plantation (C)	PP	81.8	Characterized by nearly pure stands of eastern white pine, usually planted in rows	white pine
	I.A.8.N.c.	Conical-crowned temperate or subpolar needle-leaved evergreen forest	Needle-leaved evergreen forest (C)	EFU 1	5.9	Characterized by small mature stands of various conifers such as spruces and pines associated with former homesteads and other planted areas.	spruces and pines – typically not white pine
	I.B.2.C.b.	Orchards and groves (fruit and nut trees)	Orchard (C)	OR	13.0	This community describes old orchards that have been unmaintained for at least several decades.	typically apple
	I.B.2.N.a.	Lowland or submontane cold-deciduous forest	Fagus grandifolia - Acer saccharum - (Liriodendron tulipifera) Forest (A)	FU1	1,439.5	A diverse community common to mesic, gently sloping sites	American beech and sugar maple dominate the canopy.
			Fagus grandifolia - Quercus spp. - Acer spp. Forest (A)	FU2	2,292.2	A forest community that is an intermediate between upland and lowland and contains species common to both wet and dry environments.	Sugar maple, red maple, northern red oak, American beech, yellow-poplar, white oak, swamp white oak, pin oak, green ash, and American elm.
			Quercus alba - (Quercus rubra, Carya spp.) Forest (A)	FU3	434.2	It is found on well-drained sites often in gently sloping areas.	White oak, northern red oak, shagbark hickory, and bitternut hickory.
			Acer rubrum successional forest (C)	FU4	3,512.1	Characterized by a high abundance of red maple often in nearly pure stands.	Red Maple. Green ash, white ash, black cherry, and sugar maple often are present, but never dominant.
			Mixed Cold-Deciduous successional forest (C)	FU5	1,653.3	Indicative of a late stage of recovery following significant disturbance (e.g., clear-cutting).	White ash, wild black cherry, red maple, black locust, quaking aspen, and bigtooth aspen

TABLE 9: SUMMARY OF THE CAMP RAVENNA FGDC VEGETATION FORMATIONS AND CORRESPONDING COMMUNITY OR ALLIANCE							
DOMINANT VEGETATION	FGDC CODE	FORMATION	COMMUNITY (C) OR ALLIANCE (A)	MAP CODE	ACRES	DESCRIPTION	DOMINANT SPECIES
Forest Formation	I.B.2.N.d.	Temporarily flooded cold-deciduous forest	Fraxinus pennsylvanica - Ulmus americana - Celtis (occidentalis, laevigata) Temporarily Flooded Forest (A)	FL1	2,309.4	Associated with floodplains near streams and rivers and other temporarily flooded areas.	Green ash, American elm, hackberry, and red maple. Black walnut, white ash, swamp white oak, cottonwood, and black willow also are present.
			Salix nigra Temporarily Flooded Forest (A)	FL2	81.9	It is generally found immediately adjacent to streams.	Black willow in association with other less abundant species such as cottonwood, American elm, green ash.
	I.B.2.N.e.	Seasonally flooded cold-deciduous forest	*Acer rubrum - Fraxinus pennsylvanica* Seasonally Flooded Forest (A)	FL3	219.8	A mixture of upland, mesic species in combination with hydrophytic species. It is located in areas subject to seasonal flooding.	Red maple, American elm, green ash pin oak, swamp white oak, and quaking aspen
			Quercus palustris - (*Quercus bicolor*) Seasonally Flooded Forest (A)	FL4	980.2	Characterized by species tolerant of seasonally saturated or inundated conditions. Standing water (e.g., vernal pools) is often present in the spring and early summer. By late summer and fall, these areas generally are dry.	Pin oak, swamp white oak, and red maple are the dominant tree species.
	I.C.3.N.a.	Mixed needle-leaved evergreen-cold-deciduous forest	Tsuga Canadensis – Betula alleghaniensis Forest (A)	MFU 1	60.5	Characterized by a closed canopy forest with a sparse herbaceous layer.	Easter hemlock in combination with sugar maple, yellow birch, and American beech.
			Mixed needle-leaved evergreen cold-deciduous forest (C)	MFU 2	136.2	Indicative of a late stage of recovery following significant disturbance, such as clear cutting. Characterized by a mixture of pioneer species and a somewhat open canopy.	White ash, wild black cherry, red maple, black locust, quaking aspen, and bigtooth aspen.

TABLE 9: SUMMARY OF THE CAMP RAVENNA FGDC VEGETATION FORMATIONS AND CORRESPONDING COMMUNITY OR ALLIANCE							
DOMINANT VEGETATION	FGDC CODE	FORMATION	COMMUNITY (C) OR ALLIANCE (A)	MAP CODE	ACRES	DESCRIPTION	DOMINANT SPECIES
Shrub Formation	III.B.2.N.a.	Temperate cold-deciduous shrubland	Dry mid-successional cold-deciduous shrubland (C)	SU1	2,898.7	Characterized by shrub species covering more than 50 percent of the area with relatively few large trees (greater than seven meters or ~ 20 feet in height). Found within previously disturbed areas at the RTLS	Gray dogwood, northern arrowwood, blackberry, hawthorn, and multiflora rose
			Dry late-successional cold-deciduous shrubland (C)	SU2	661.5	Young pioneer trees generally less than seven meters in height are dominant. Shrub and herbaceous species are still present although to a lesser extent.	Red maple, wild black cherry, white ash, and black locust
	III.B.2.N.c.	Intermittently flooded cold-deciduous shrubland	Intermittently flooded mid-successional cold-deciduous shrubland (C)	SL1	207.8	Very similar to the Dry mid-successional cold-deciduous shrubland community. However, this community is characterized by the presence of hydrophytic species.	Willows, silky dogwood, eastern cottonwood, and quaking aspen. Patches of sedges, rushes, and bulrushes also are present.
			Intermittently flooded late-successional cold-deciduous shrubland (C)	SL2	123.8	Young pioneer trees generally less than seven meters in height are dominant.	Red maple, eastern cottonwood, quaking aspen, and green ash
	III.B.2.N.f.	Semipermanently flooded cold-deciduous shrubland	*Cephalanthus occidentalis* Semipermanently Flooded Shrubland (A)	SL3	54.5	Occupies shallow water areas (e.g., depressions, ponds, floodplains). In some environments it is a dense shrub-thicket and in others it is open shrubland with open water areas.	Buttonbush, winterberry, swamp rose, common elder, northern arrowwood, willows, and dogwoods
	III.B.2.N.g.	Saturated cold-deciduous shrubland	*Cornus* spp. - *Salix* spp. Saturated Shrubland (A)	SL4	302.3	Found in many locations at the RTLS including edges of open water, beaver dams, swales, ditches, depressional areas in fields and forests, and along small creek tributaries.	Dogwood species (especially silky dogwood), pussy willow, black willow, swamp rose, meadow-sweet, common elder, and northern arrowwood

TABLE 9: SUMMARY OF THE CAMP RAVENNA FGDC VEGETATION FORMATIONS AND CORRESPONDING COMMUNITY OR ALLIANCE							
DOMINANT VEGETATION	FGDC CODE	FORMATION	COMMUNITY (C) OR ALLIANCE (A)	MAP CODE	ACRES	DESCRIPTION	DOMINANT SPECIES
Herbaceous Formation	V.A.5.C.a.	Perennial grass crops (hayland, pastureland)	Hayfield (C)	HY	125.2	Large open areas composed of various species of grasses.	Grass
	V.A.5.C.b.	Landscaped urban/ suburban/rural (yards, nurseries)	Landscaped/ Maintained grounds around buildings	LM	260.2	Maintained vegetation composed mainly of grasses, mowed periodically, ornamental trees and shrubs.	Grass, ornamental trees and shrubs
	V.A.5.N.c.	Medium-tall sod temperate or subpolar grassland	Maintained grassland (C)	MG	104.3	Areas seeded with grass in the past, currently maintained in a grassland condition through periodic mowing.	grass
	V.A.5.N.k.	Seasonally flooded temperate or subpolar grassland	*Phalaris arundinacea* Seasonally Flooded Herbaceous (A)	HL2	135.3	Found most often in depressional areas and swales in previously cleared fields.	Reed canary grass
			Typha spp. - (*Scirpus* spp. - *Juncus* spp.) Seasonally Flooded Herbaceous (A)	HL3	117.4	Saturated or inundated conditions prevail during much of the growing season, but water depths generally do not exceed 15 centimeters (~ six inches).	Cattails, bulrushes, rushes, giant bur-reed, big-leaved arrowhead, duckweed, blue vervain, manna-grass, and water plantain
	V.A.5.N.l.	Semipermanently flooded temperate or subpolar grassland	*Typha* spp. - (*Scirpus* spp.) Semi-permanently Flooded Herbaceous (A)	HL4	169.4	Along pond edges, roadside ditches, and shallow basins	Pure stands of narrow-leaf and broad-leaf cattails
	V.B.2.N.a.	Tall temperate or subpolar perennial forb vegetation	Dry early successional herbaceous field (C)	HU1	2,054.0	Present in recently disturbed areas without sufficient recovery time for significant invasion by shrub species.	Goldenrod, clasping-leaf dogbane, self-heal (heal-all), yarrow, strawberry, sheep sorrel, and fescue
	V.B.2.N.c.	Intermittently flooded temperate perennial forb vegetation	Intermittently flooded early successional herbaceous field (C)	HL1	79.5	Very similar to the Dry early-successional herbaceous field community, but additional presence of species found in wet environments	Sedges, rushes, and bulrushes
	V.C.2.N.a.	Permanently flooded temperate or subpolar hydromorphic rooted vegetation	*Nuphar lutea* - *Nymphaea odorata* Permanently Flooded Herbaceous (A)	HL5	79.1	Permanently flooded areas such as shallow ponds or lakes with depths generally less than 0.5 meters.	Spatterdock and white water lily
			Potamogeton spp. - *Ceratophyllum* spp. - *Elodea* spp. Permanently Flooded Herbaceous (A)	HL6	44.5	Occurs in shallow open water areas generally less than 2 meters deep.	Pondweeds, hornworts and waterweed species

For descriptions and additional information for each plant community type consult the *Vegetation Communities Planning Level Survey for the Ravenna Training and Logistics Site* (AMEC, 2006d). A copy of this report is on file in the Camp Ravenna Environmental Office.

4.2.3 INVASIVE SPECIES OBSERVED AT CAMP RAVENNA

Invasive and exotic species may include plants, insects, or animals. An **invasive** species is defined as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." An alien (or **exotic**) species is defined as a "species including its seeds, eggs, spores, or other biological material capable of propagating that species that is not native to that ecosystem (*EO* 13112, *Invasive Species*, dated 3 February 1999)". Because of their invasive capacity, many exotic species have the ability to spread rapidly through ecosystems since their natural predators are often not present. Such species often retard natural succession and reforestation and generally cause a reduction of biological diversity in natural ecosystems.

Noxious weeds are defined as "any living stage (including but not limited to, seeds and reproductive parts) of any parasitic or other plant of a kind, or subdivision of a kind, which is of foreign origin, is new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation or the fish and wildlife resources of the United States or the public health (*Federal Noxious Weed Act of 1974*)."

Of the plant species identified in the 1998 and 1999 vascular plant survey, 25 percent are not considered to be native to Ohio. This is slightly higher than the national average of non-native plant species, but slightly lower than the percentage of non-native plants in Portage County (ODNR – DNAP 2000). Refer to **Appendix D** for the list of non-native plant species (non-native plants are denoted by "*").

No federal noxious species, designated in 7 CFR §360.200, *Designation of noxious weeds*, 27 April 2001, were identified at Camp Ravenna during floral surveys (ODNR – DNAP, 2000). However, eight of the 21 state noxious weeds that are designated prohibited noxious weeds in the State of Ohio under OAC 901:5-37-01, *Prohibited noxious weeds*, 23 Marcg 2012 were identified during surveys. These species include:

- Canada thistle (*Cirsium arvense*)
- Canadian horseweed (*Conyza canadensis*)
- Johnsongrass (Sorghum halepense)
- Oxeye daisy (*Chrysanthermum leucanthemum* var. *pinnatifidum*)
- Purple loosestrife (*Lythrum salicaria*)
- Queens Anne's Lace (*Daucus carota*)
- Wild parsnip (*Pastinaca sativa*)
- Japanese Knotweed (*Polygonum cuspidatum*)

The state noxious weed law requires control of these species only if a complaint is filed with a Township Trustee. Camp Ravenna is then notified by the Township to initiate control. However, EO 13112, *Invasive Species*, and DoDI 4715.03 require Federal agencies to control exotic species on Federal land.

Not all non-native plant species at Camp Ravenna pose a direct threat to native flora. Examples of non-native species that do not pose a threat include chocolate vine (*Akebia quinata*), garlic (*Allium sativum*), forsythia (*Forsythia suspensa*), red pine (*Pinus resinosa*), pear (*Pyrus communis*), French rose (*Rosa gallica*), moss rose (*Rosa muscosa*), Bridal wreath (*Spiraea vanhouttii*), and Japanese snowball (*Viburnum plicatum*).

4.2.4 FOREST RESOURCE INVENTORY

4.2.4.1 FOREST PLANT COMMUNITIES

Descriptions of plant communities are given in **Section 4.2.2** of this plan. The 1999 Camp Ravenna Plant Communities Inventory identified a total of 13,330 acres of forest at the Camp Ravenna as opposed to 16,182 acres identified in the Camp Ravenna Timber Inventory. The acreage difference is based on differences in how plant communities are classified by the Federal Geogaphic Data Committee system and for forest inventory purposes. Many of the areas classified as shrubland plant communities are included as seedling/sapling forestland in the timber inventory. Special Interest Forest Plant Communities

The forested acreage on the installation at the time of acquisition in 1939 was approximately 5,000 acres. Because of military ownership, active forest management, and time the forest acreage has tripled. Some of the forest plant communities at Camp Ravenna are unique to northeast Ohio and even globally. These areas have been included within Special Interest Areas. Special Interest Area is not a regulatory designation and these areas are not off limits to military use or forest management. They are simply recognized for their special attritubes and receive management emphasis. Training land uses compatible with sustaining ecosystem function are designated for these areas. Special attention is given to the unqueness of these ecosystems when implementing forest management prescriptions.

Section 4.4.3 of this plan identifies the Special Interest Areas and unique forest communities at Camp Ravenna. **Figure 8** shows the location of these plant communities. Special Interest Area Unit 1 includes timber cutting units 4-K1, 4-Y1, 6-V, 6-W, 9-B, 9-C, 9-D, 9-E, 9-F, 9-G, 9-H, and part of 10-T and 10-U. Special Interest Area Unit 2 includes timber cutting unit 4-Y1. Special Interest Area Unit 3 includes timber cutting units and 8-C, 8-D, 8-E, 8-F, 8-G, 8-H, 8-I, 8-J, 8-K, 8-L, 8-M, 8-N, 8-O, and 9-A. Special Interest Area Unit 4 includes all or parts of timber cutting units 7-A3, 7-D3, 7-E3, and 7-G3. Special Interest Area Unit 5 includes part of cutting unit 4-Z1. Forest management in these units is addressed in Section 6.

4.2.4.2 TIMBER INVENTORY

Forest inventories are conducted every ten years, to determine the volume, stocking density, and condition of the timber resource. The inventory is also used to acquire data on forested and non-forested acreage, numbers of wildlife den trees and dead trees, general forest conditions, and to provide management recommendations. The latest forest inventory of Camp Ravenna was done in 1998/99. The final report is available in the Camp Ravenna Environmental Office.

For management purposes, Camp Ravenna has been divided into 10 Forest Management Compartments, numbered 1 through 10. Each compartment has been subdivided into cutting units designated by a letter, a through z. Compartment and cutting unit designations were made based on easily definable boundaries such as roads, creeks, fence lines, etc. Cutting units do not reflect forest type boundaries. Forest type boundaries are shown on the Plant Community Maps (**Figures 8 and 9**). Timber compartments and cutting units are illustrated on **Figure 10.**

The total estimated sawtimber volume (board feet, Doyle Rule), square feet of basal area per acre (sawtimber acreage), estimated annual growth, and the estimated 10-year growth by compartments are shown in **Table 10**. Pulpwood volumes were not inventoried and are not shown because there is no pulpwood market in the Camp Ravenna area. The estimated total standing sawtimber volume per species at Camp Ravenna is summarized in **Table 11**.

TABLE 10: SAWTIMBER VOLUME AND ESTIMATED 10 YEAR GROWTH BY FOREST MANAGEMENT COMPARTMENT				
COMPARTMENT	AVERAGE/ ACRE BASAL AREA	VOLUME, DOYLE RULE (2013)*	ESTIMATED TOTAL ANNUAL GROWTH*	ESTIMATED TOTAL 10-YEAR GROWTH*
1	117	2,914,500	56,360	563,600
2	124	2,424,500	65,550	655,500
3	123	2,821,300	94,420	940,200
4	136	3,802,100	101,250	1,012,500
5	135	4,619,440	135,640	1,356,400
6	131	3,007,800	70,230	702,300
7	138	5,047,400	134,900	1,349,000
8	140	2,156,300	49,000	490,000
9	127	2,427,700	50,100	501,000
10	137	3,621,900	84,930	849,300
Totals	131 (avg.)	32,842,940	842,380	8,423,800

*Ash mortality not accounted for.

TABLE 11: SAWTIMBER BY SPECIES	
SPECIES	SAWTIMBER VOLUME, DOYLE RULE (2013)
Red Maple	6,278,623
Red Oak	5,668,789
Pin Oak	5,553,335
American Beech	2,273,034
Black Cherry	2,121,689
Hickory	2,259,702
Sugar Maple	1,683,648
Yellow Poplar	1,325,288
Ash*	133,900
Swamp White Oak	1,304,450
Other	3,035,382
Total**	31,637,840

*Estimated decline according to current USFS data, 90% reduction- 10% survival.
**Includes 10% Ash in 5 years.

Forested and non-forested acreage at Camp Ravenna is summarized in **Table 12**. Total forested acreage includes sawtimber acreage, poletimber acreage, and adequate regeneration acreage (>300 seedlings/saplings per acre). Inadequate regeneration acreage represents reverting fields and other areas with less than 300 seedling/saplings per acre. Other acreage includes improved areas, buildings, roads, open water, marshes and swamps, and other miscellaneous non-forested land. The combined total acreage is slightly off from the total Camp Ravenna acreage of 21,683 acres. This is due to sampling error and because the forest inventory did not account for acreage outside of the perimeter fence other than the east training areas.

TABLE 12: SUMMARY OF FORESTED AND NON-FORESTED ACREAGE AT CAMP RAVENNA*

COMPARTMENT	SAWTIMBER ACREAGE	POLETIMBER ACREAGE	ADEQUATE REGENERATION ACREAGE	TOTAL FOREST ACREAGE	INADEQUATE REGENERATION ACREAGE	OTHER ACREAGE	COMBINED TOTAL ACREAGE
1	550	504	407	1,461	165	74	1,700
2	397	282	193	872	27	51	950
3	597	974	652	2,223	870	234	3,327
4	773	1,209	1,166	3,148	646	356	4,150
5	930	950	410	2,310	135	381	2,826
6	540	372	334	1,246	296	249	1,791
7	994	681	371	2,046	559	255	2,860
8	502	133	125	760	24	27	811
9	390	150	50	590	48	40	678
10	689	483	372	1,544	165	207	1,916
Totals	6,362	5,738	4,080	16,200	2,935	1,894	21,009

*Based on 1999 Forest Inventory

4.2.4.4 CERTIFIED TREE FARM

Camp Ravenna contains a total of 19,130 acres of actively managed woodlands that are currently enrolled as three contiguous yet separate tree farms in the American Tree Farm Systems' Certified Tree Farm Program. The American Tree Farm System is a program of the American Forest Foundation (AFF) and recognizes those woodlands, public and private, which are proactively managed in accordance with all state and federal environmental laws in order to enhance the health, productivity and sustainability of the forest ecosystem. Because sustainable forest ecosystem management is at the core of the Tree Farm Program's mission, Christmas Tree Farms and orchards, for example, are not eligible for this recognition. Criteria for enrollment as a Certified Tree Farm include having an updated working management plan for the woodland, performing timber stand improvement (TSI) practices as needed to enhance desirable tree growth and regeneration, performing periodic surveys for rare species and protection of any known sites of historical or cultural significance. Other eligibility requirements that must be met for enrollment include a contiguous woodland not less than ten (10) acres in size, use only of EPA approved chemicals and pesticides for performing required silvicultural operations as well as compliance with all best management practices for logging operations or any other activity on site where soil disturbance could be an issue. All of these criteria are covered in this Camp Ravenna INRMP.

By being recognized as a Certified Tree Farm by the American Forest Foundation, the OHARNG is demonstrating to the public that we take proper management of the people's natural resources very seriously and that we are committed to doing so long-term. The Certified Tree Farm Program recognizes those exemplary landowners and land managers who go the extra mile to manage forest resources including water, wildlife and rare species. By managing the woodland resources at Camp Ravenna wisely and responsibly, we are also showing the public what good, sustainable forest management is all about and what a well managed forest looks like and provides for everyone to enjoy.

Camp Ravenna's woodlands were broken into three individual contiguous Tree Farms of relatively similar size during the 2012 five-year reinspection cycle in order to remain certified as non-industrial forest lands, an objective set forth in INRMP Section 6.8. Tree Farm 3497 contains 5,616 wooded acres and is made up of management units 1-3. Tree Farm 3497A contains 6,238 wooded acres and is made up of management units 4-5. Tree Farm 3497B contains 7,276 wooded acres located

throughout management units 6-10. As Certified Tree Farms under the American Tree Farm System, each Tree Farm is subject to a regular five-year reinspection as well as required random sampling at the discretion of the American Tree Farm System. A map outlining the boundaries of these three Certified Tree Farms at Camp Ravenna can be seen in **Figure 10b, 19, and 20**.

4.2.5 GRASSLANDS AND YOUNG FOREST HABITAT

Grassland is considered a valuable habitat component for many species of wildlife, particularly certain species of birds. Grasslands were not a major part of the landscape in Camp Ravenna area prior to European settlement. Clearing for agriculture resulted in habitat changes and grassland establishment in abandoned fields and pastures. This habitat component is now considered rare in northeastern Ohio. Large acreages of quality grassland habitat is not present at Camp Ravenna, and it is not the general practice of this plan to maintain artificial plant communities. However, certain grasslands contribute to overall biological diversity and are needed for completion of the military mission. These grasslands are also utilized by several state-listed rare bird species (see Appendix D).

Grasslands have been classified as either primary grasslands or secondary grasslands for management purposes at Camp Ravenna. Primary grasslands are grasslands where vegetation control/ management can be done outside of the nesting season and training use of the area is mostly compatible with grassland management objectives. Primary grasslands may also include some areas in need of grassland restoration that once restored will meet the criteria as a primary grassland. Secondary grasslands are grassland areas where mission needs do not allow for vegetation control/management to always be conducted outside of the nesting season. These areas generally receive heavy training usage or more intensive mowing and habitat management is not a primary consideration.

Grassland habitats are shown on **Figures 8 and 9.** Managed grassland areas are shown on **Figure 15** and include the following areas:

4.2.5.1 PRIMARY GRASSLANDS

A 30-acre switchgrass field is located west of Slagle Road and north of Newton Falls Road. This field was established in 1993 as a wildlife cover habitat. Other species of grasses/herbaceous species have established themselves in areas of the field not ideally suited to switchgrass. This has broken up the continuous density of the field and created habitat diversity within the switchgrass monoculture. This field is a nesting site for the Northern Harrier and at least one male pheasant has been seen in the area for the past several years.

Approximately 10 acres of grassland were created around Wetland Mitigation Site 1 (Daugherty's Pond) by sowing native species after the construction of the wetland. Swamp white oak and bur oak trees have been planted in some areas to add plant diversity and a food source for waterfowl.

Approximately nine (9) acres of grassland straddle Wadsworth Road just south of the Stone Arch Bridge. This area is the remnant of two home sites and provides grassland habitat in need of restoration to retard woody plant encroachment and restore native species.

There is a small 3.5-acre grassland within the land navigation course in Training Area 33 east of Greenleaf Road along the south perimeter. Miscellaneous other location within TA33 are also managed by mowing and/or brush cutting to retain an old field habitat with visual obstructions but not choked out with multiflora rose, blackberries, gray dogwood, silky dogwood and othe dense shrubby vegetation.

There are approximately nine (9) acres of grassland around Big and Little Paul's Ponds east of Wilcox-Wayland Road. Consistent mowing and/or burning are required to keep this area from becoming overgrown with woody vegetation. This area serves as a limited habitat grassland type near a wetland complex surrounded by shrub and dense forest habitat.

There is approximately five (5) acres of grassland that abuts the western edge of the Route 80 wetland mitigation wetland basins. This area is in the southeast corner of the intersection of Route 80 and North Line Road.

There is approximately seven (7) acres of grassland adjacent to the south end of C-Block. This is another area where consistent mowing and/or burning is needed to prevent woody plant encroachment. This area serves a unique habitat function as an opeing next to a beaver pond in an otherwise forested area.

The 11-acre grass covered earth cap on the Ramsdell Landfill functions as a grassland habitat adjacent to a wetland in an otherwise densely forested area. The earth cap is required to be maintained intact to protect the closed landfill. Annual inspection and mowing are conducted with mowing being done after the nesting season.

A portion of the abandoned former main transmission line right of way is now managed as grassland. The grassland portion is approximately 200 feet wide 2.5 miles long (60 acres) and crosses over Big Cobb's Pond. It extends from the shoot house in the west to an old substation in the east. This grassland is in the middle of dense forest and intersects streams and wetlands.

4.2.5.2 SECONDARY GRASSLANDS

The MPMG/Mark 19 Range contains approximately 200 acres of grassland. This area was historically open grassland and used as an open burning area when Camp Ravenna was a munitions plant. The area started to revert back to forest by the early 2000's. The OHARNG restored and expanded the grassland by constructing ranges on the site. The area must remain free of trees to enable line of sight to targets. This is mostly done by annual mowing. The mission requires maintaining low vegetation around the targets and a line of sight while the range is in use. Mowing can often be delayed on large expanse area until after breeding bird season.

The Slagle Road Drop Zone contains approximately 100 acres of wet meadow and grassland. This area is maintained by the Air Force Reserve by annual mowing. The mission requires maintenance of low vegetation. Early and delayed mowing are done when possible.There are no known occurrences of rare species in this area.

The YAK Drop Zone at the southeast corner of the intersection of Route 80 and South Patrol Road contains approximately 40 acres of grassland. There's an additional area of approximately 3 acres adjent to the southeastern portion of this area that is normally heavily used for training and not considered viable grassland.

The Multiple Integrated Laser Engagement System (MILES) Tank Table II Range in the Trumbull County portion of the post contains approximately 85 acres of grassland. A small native wildflower patch (10 acres) was established in 1999 and a wetland mitigation pond shortly thereafter in the northern portion of the area between the target mover berms. The area is managed similar to the MPMG/MK-19 Range in that minimal mowing needed to support the mission is done during nesting season and expanse areas, to include the bore sight lane, are mowed/burned after nesting season. Henslow's sparrows and Bobolinks have nested in this area in the past. Included with this area is a bore-sight lane that runs north from the helipads in Group 7 and to the range.

The Tactical Vehicle Manuever Area, formerly a hayfield, is south of the North Gate (Post 13) and consists of approximately 64 acres of grassland on the east side of Paris-Windham Road. The area is used for off-road maneuver of Bradley Fighting Vehicles, Tanks and other tracked and wheeled vehicles. Extensive surface water management controls are in place and require inspection, discharge sampling and maintenance. Mowing is done as needed to facilitate the mission and site management. Delayed mowing is done when possible. Henslow's sparrows have been known to nest in this area.

There is a small 4-acre grassland area around the Big Cobb's Pond picnic area. This area is intermittently used. The grassland is maintained by mowing. The roadside and area immediately around the pavilion and playground are mowed prior to use or when roadsides are being mowed. Delayed mowing is practiced on the expanse areas when possible.

There is a small 6-acre grassland on the west side of Route 80 approximately midway between Newton Falls Road and McCormick Road and up against the woodline. This area is used as a bivouac and tactical staging area. Mowing is done as needed to support the mission with delayed mowing practices when possible.

In TA21 along the southwestern perimeter east of Route 80 there is an approximately 60-acre grassland. This area is used for field artillery and howitzer deployment training, bivouacking and as a tactical staging area.Mowing is done as needed to support the mission with delayed mowing practices when possible.

There is approximately 10 acres of grassland at the east end of the old NACA crash strip west of Greenleaf Road. This area is used often for training but sometimes goes most of the nesting season without being mowed. There are wetlands and forest adjacent to the grassland.

Other secondary grasslands include the acces trails and/or earthen dams for Frank's Pond and Snow Road Pond.

Various other reverting grassland areas located throughout Camp Ravenna may from time to time be brush cut or mowed and used for a training mission. Vegetation cutting is done outside nesting season unless there is a critical mission need to do otherwise.

4.2.5.3 YOUNG FOREST HABITAT

Eight areas on Camp Ravenna, totaling approximately 128 acres have been designated for intentional management as successional forest habitat (young forest habitat). These areas are so designated and managed to add a dense young forest habitat component to the existing old field, scrub-shrub, forest, and grassland habitats. The designated areas are as follows and are show on **Figure 15**.

Unit 1-B is approximately 14.3 acres and is located west of Load Line 8 and east of Greenleaf Road on the south side of Fuze and Booster Road.

Unit 1-C is approximately 15.6 acres and is located west of Greenleaf Road along the south perimeter road just west of Hinkley Creek.

Unit 2-A is approximately 19.5 acre and is located on the west side of Route 80 south of Newton Falls Road and SE of the Collapsed Structure Simulator.

Unit 2-C is approximately 9.2 acres and is located at the intersection of Newton Falls and Bundling Roads, and is between Magazine Road (southern boundary) and Bundling Road (northern boundary).

Unit 2-E is approximately 1.7 acres and is located on the east side of Route 80, north of Newton Falls Road and south the Route 80 wetland mitigation site.

Unit 3-A is approximately 34.0 acres and is located on the west side of Greenleaf Road, about 0.20 mile south of Newton Falls Rd., and just north of an old powerline clearing.

Unit 3-B is approximately 9.50 acres and is located on the south side of Newton Falls Road, and on the east side of C-Block.

Unit 3-C is approximately 24.20 acres and is located south of the Trout Pond on both the north and south sides of Newton Falls Road just west of C-Block.

4.3 FISH AND WILDLIFE

4.3.1 MAMMALS

A total of thirty-five (35) species of land mammals have been identified at the installation through casual observations and two studies (Schneider, 1993; Carroll, 1999). The most abundant species observed include white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), woodchuck (*Marmota monaxv*), and eastern fox squirrel (*Sciurus niger*).

WHITE-TAILED DEER
(PHOTO ODNR)

The OHARNG commissioned and conducted separate surveys for avian mammals (bats) at Camp Ravenna (Tawse, 1999; Davey Resource Group, 2002; Duffey & Brack, 2005, Tragus 2010). Eleven species of bats are known to live in Ohio, and eight of these species were identified at Camp Ravenna. Bat species captured included little brown bat (*Myotis lucifugus*), big brown bat (*Eptesicus fuscus*), northern long-eared bats (*Myotis septentrionalis*), eastern red bat (*Lasiurus borealis*), silver haired bat (*Lasiurus noctivagans*), evening bat (*Nycticeius humeralis*), tri-colored bat (*Pepistrellus subflavus*), and hoary bat (*Lasiurus cinereus*). Netting efforts provided no evidence of the federally endangered Indiana bat (*Myotis sodalis)*. Most of the roosting habitat with proximity of mist net sites was rated as of moderate value for the Indiana bat, although some high quality summer roosting habitat does exist on the installation. The habitat supports reproduction by all species captured. Reproduction of the little brown and northern long eared bats suggest that many aspects of the habitat are suitable for the Indiana bat.

RIVER OTTER
(PHOTO ODNR)

The northern river otter (*Lutra canadensis*) is a species found at Camp Ravenna that was listed as state endangered just a few years ago. This species has made such a phenomenal comeback that it is no longer listed and a managed trapping season has been established for it. The bobcat is a state-listed species found at Camp Ravenna. It has been indirectly observed through sign for several years and one was released at Camp Ravenna by the ODOW in 2003.

The star-nosed mole (*Condylura cristata*), the woodland jumping mouse (*Napaeozapus insignis*), and the pygmy shrew (*Sorex hovi*) are state-listed as well. The star-nosed mole is arguably the most unusual of the moles found in Ohio. The star-nosed mole is more aquatic than other members of the genus in Ohio and it usually lives around swamps, ponds, and other wet areas. The woodland jumping mouse was an unexpected find at Camp Ravenna because the species is primarily associated with cool ravines and wooded gorges in northeastern and eastern Ohio. This species was captured in a variety of habitats (pond and wetland edges, and brushy fields) and in numbers that indicate a fairly widespread population on the Camp Ravenna property (Ohio DNAP 1993).

Beginning in 2012, at least one American black-bear (*Ursus americanus*) has been seen roaming about the grounds at Camp Ravenna. The black-bear is currently listed as state endangered in Ohio and is therefore prohibited from being hunted or trapped. Multiple sightings of the bear were reported by Camp Ravenna staff throughout 2013, however no sightings were reported in 2014. All employees, contractors and visitors on site are briefed about the potential presence of the bear and asked to report to Camp Ravenna Environmental staff where on site and at what time it was spotted and in which direction it was heading. It is Camp Ravenna's policy not to feed or disturb the black bear(s) on site in any way.

The complete taxa list for all mammals identified at Camp Ravenna is included in **Appendix D**.

4.3.2 BIRDS

Surveys of avian communities at Camp Ravenna were conducted in 1993, 1999, and 2001 through present (Schneider, 1993; Rosche, 2005; BHE Environmental, 2006; Semroc & Rosche, 2009-2013). Methods used for censusing include foot surveys, point counts and breeding bird survey (BBS) routes. Point counts and breeding bird survey routes are completed in accordance with USFWS standards.

The diversity and abundance of contiguous habitat at Camp Ravenna has enhanced the diversity and abundance of breeding bird species. Camp Ravenna is located in a glaciated physiographic region of the State, and statewide surveys have identified this region as having the highest average number of bird species per sample block in comparison to the rest of Ohio. A total of **214** species of birds have been identified at Camp Ravenna and approximately 114 species were either confirmed or considered likely to nest on Camp Ravenna properties (**Appendix D**). Many of the species present at Camp Ravenna are considered neotropical migratory species. Most neotropical migratory birds are songbirds (for example, warblers, thrushes, vireos, tanagers); however, some species of raptors and waterfowl are also neotropical migrants.

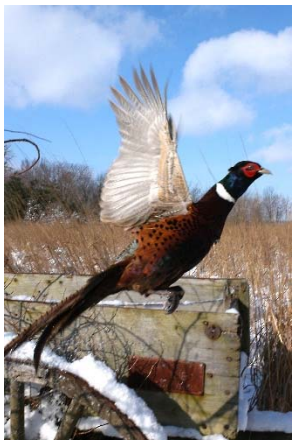
AMERICAN GOLDFINCH
(PHOTO ODNR)

There are abundant populations of some of the more common species in Ohio, including the song sparrow (*Melospiza melodea*), field sparrow (*Spizella pusilla*), common yellowthroat (*Geothlypis trichas*), gray catbird (*Dumetella carolinensis*), eastern towhee (*Pipilo erythrophthalmus*), American goldfinch (*Carduelis tritis*), and blue-winged warbler (*Vermivora pinus*). Alder flycatchers (*Empidonax alnorum*), a species that nests in wet shrub dominated habitats in northern Ohio and considered to be uncommon and local at best in Ohio, were common at Camp Ravenna. The numbers of chestnut-sided warblers (*Dendroica pensylvanica*) nesting at Camp Ravenna were also greater than expected.

In one survey, approximately 220 pairs of veeries (*Catharus fuscescens*), inhabitants of damp second growth woods with dense understories, were counted. There are also approximately 184 pairs of wood thrush (*Hylocichla mustelina*), a neotropical migratory species that is declining statewide due to habitat loss. Camp Ravenna provides abundant woodland edge and open second growth woods habitat, supporting neotropical woodland inhabitants such as the rose-breasted grosbeak (*Pheucticus ludovicianus*), red-eyed vireo (*Vireo olivaceus*), yellow-throated vireo (*Vireo flavifrons*), eastern wood-pewee (*Contopus virens*) and acadian flycatcher (*Empidonax virescens*) in addition to permanent residents such as the tufted titmouse (*Parus bicolor*), black-capped chickadees (*Poecile atricapillus*), American crows (*Corvus brachyrhynchos*), blue jays (*Cyanocitta cristata*), and various woodpeckers (*Melanerpes spp.*). A few species identified were at the edge of their range, including the Kentucky warbler (*Oporornis formosus*), black-and-white warbler (*Mniotilta varia*), white-eyed vireo (*Vireo griseus*), and yellow-breasted chat (*Icteria virens*).

PIED-BILLED GREBES
(PHOTO ODNR)

Some common wetland birds found at Camp Ravenna are red-winged blackbirds (*Agelaius phoeniceus*), great blue herons (*Ardea herodias*), tree swallows (*Tachycineta bicolor*), mallards, and wood ducks. The wetlands at Camp Ravenna are also a major stopover point for various water bird species during migration, including pied-billed grebes (*Podilymbus podiceps*), horned grebes (*Podiceps auritus*), gadwall (*Anas strepera*), American wigeon (*Anas americana*), and ring-necked duck (*Aythya collaris*).



RING-NECKED PHEASANT (PHOTO ODNR)

The grassy area within Tank Table II Range supports grassland populations of the savannah sparrow (*Passerculus sandwichensis*) and the grasshopper sparrow (*Ammodramus savannarum*). This grassland has at times times supported a small colony of Henslow's sparrows, also an Ohio Species of Special Interest. The switchgrass field at the northwest intersection of Slagle Road and Newton Falls Road provides habitat for the northern harrier. It also provides habitat for the grasshopper sparrow, ring-necked pheasant, and other grassland birds.

Some state-listed species also utilize wetlands at Camp Ravenna, including the little blue heron (*Egretta caerulea*), American bittern (*Botaurus lentiginosus*), least bittern (*Ixobrychus exilis*), northern waterthrush (*Seiurus noveboracensis*), sora (*Porzana carolina*), Virginia rail (*Rallus limicola*), and common moorhen (*Gallinula chloropus*).

There is currently an active bald eagle (*Haliaeetus leucocephalus*) nest is located in forest management compartment 3. While the bald eagle has been delisted, it is still legally protected under the federal Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. This species is currently a Federal Species of Concern and is subjected to continuous monitoring by the USFWS.

4.3.3 REPTILES AND AMPHIBIANS

At least 34 species of amphibians and reptiles have been documented at Camp Ravenna. This includes eleven salamanders, one toad, eight frogs, ten snakes, one lizard, and three turtle species (Schneider, 1993; Pfingsten, 2000; BHE Environmental, 2006, Pfingsten, 2010). The complete taxa list is found in **Appendix D**.

Camp Ravenna contains a variety of wetland types (streams, ponds, vernal ponds, and springs), which generates an increased diversity of habitat types available to herpetofauna. The 1999 survey identified nine specific habitats or habitat types that are important to the diversity of reptiles and amphibians at Camp Ravenna. These habitats included the hatchery ponds, Wadsworth Glen, mesic and wet wood patches, vernal pools, Sand Creek, pin oak woods, and springhead sites throughout the property (**Figure 6**). Several of these habitats are important because they were found to support the rare four-toed salamander (*Hemidactylium scutatum*) and the Eastern box turtle (*Terrapene carolina*) (Pfingsten, 2000; BHE Environmental, 2006, Pfingsten, 2010).

FOUR-TOED SALAMANDER (PHOTO RALPH PFINGSTON)

4.3.4 INSECTS

4.3.4.1 ODONATA (DRAGONFLIES AND DAMSELFLIES)

The order Odonata is divided into two suborders that include dragonflies (Anisoptera) and damselflies (Zygoptera). A majority of Odonata larvae inhabit still waters of lakes, wetlands, and slow moving streams and rivers. While adult Odonata are less water-dependant than their larvae, they are also most prevalent in aquatic habitats due to the predominance of mosquitoes upon which they prey (Voshell, 2002). The 1993, 1999, and 2010 Odonate surveys identified a total of 86 species at Camp Ravenna (DNAP, 1993; Riggs, 2001, Semroc & Rosche, 2010). Amoung the species found in 2010 is the Brush-tipped Emerald (Somatochlora walshii), a state endangered dragonfly. A taxa list of dragonflies and damselflies at Camp Ravenna is provided in **Appendix D**.

4.3.4.2 LEPIDOPTERA (BUTTERFLIES AND MOTHS)

Lepidoptera surveys conducted in 1993, 1994, 1999, and 2005 have identified 64 species of butterflies and 793 species of moths at Camp Ravenna (Rings & Downer, 1993; Rings, 1994; Gilligan, 1999; BHE Environmental, 2006). A complete taxa list of moths and butterflies at Camp Ravenna is provided in **Appendix D**.

In all, 64 species of butterflies have been observed at Camp Ravenna. Notable observations regarding the butterfly populations include: very high numbers of the Little Wood Satyr (*Megisto cymela*), Red-spotted Purple (*Limenitis arthemis astyanax*), Question Mark (*Polygonia interrogationis*), Comma (*Polygonia comma*), and Common Wood Nymph (*Cercyonis pegala*); an unusual Ohio sighting of many Spicebush Swallowtails (*Papilio troilus troilus*) nectaring on thistles in 1999; and the consistent presence of Tiger Swallowtails (*Papilio glaucus glaucus*) throughout the installation. These details emphasize the variety and quality of habitat at Camp Ravenna.

QUESTION MARK
(PHOTO ODNR)

Lepidoptera surveys have also identified a very diverse population of moths indicating a great variety of habitats and host flora. Two state-listed species, the moth *Apamea mixta* and the moth *Brachylomia algens*, have been documented on site. Several unique species were observed in the Wadsworth Glen hemlock ravine area (**Figure 11**). The Lepidoptera population at Camp Ravenna is very diverse and is rich in forest-inhabiting species, wetland species, and others that are grass and weed feeders. The greatest number of species collected feed on oak foliage. Other common host plants for these species include willows (*Salix* spp.), maples (*Acer* spp.), elms (*Ulmus* spp.), hickory (*Carya* spp.), and various species of herbaceous plants.

Several pest lepidopteran species were identified at the installation, although all of these species are apparently kept under control by parasites and predators. Most of the moth and butterfly species known from this area are native with the exception of a few species. One such non-native species is the gypsy moth (*Lymantria dispar*), which appears to have a stable and perhaps increasing population on the Post. In cooperation with the USFS, the Camp Ravenna staff monitored gypsy moth populations utilizing pheromone traps from 1990 to 1996. Gypsy moth data collected indicate an increase in population at the installation, and moth counts per trap became so high that trapping is no longer necessary. The USFS conducts annual aerial defoliation surveys. Gypsy moth damage in the area seems to be concentrated in dry white oak ridges/uplands on nearby property; this forest community type is not present at Camp Ravenna. Additionally, the gypsy moth killing fungus *Entomophaga maimaiga* is present at Camp Ravenna and is killing gypsy moth larvae. For now, gypsy moth control is not a significant concern at Camp Ravenna (Rings & Downer, 1993; Rings, 1994; Gilligan, 1999; BHE Environmental, 2006).

GYPSY MOTH
(PHOTO JOHN H. GHENT, USDA FOREST SERVICE)

CARABIDAE
(PHOTO WILLIAMS & HARTZLER)

4.3.4.3 COLEOPTERA (BEETLES)

A survey of beetles (Order Coleoptera) at Camp Ravenna was conducted over three consecutive years (1999 through 2001). This single survey effort identified 800 species of beetles, representing 78 families of beetles. The most abundant family was Carabidae, the ground and tiger beetles, representing 107 species. No threatened or endangered species were identified (Williams & Hartzler, 1999a, 1999b, 2000, 2001). A taxa list of beetles at Camp Ravenna is provided in **Appendix D**.

4.3.4.4 AQUATIC MACROINVERTEBRATES

Aquatic marcroinvertebrate surveys, which can also include Odonata, Lepidoptera, and Coleoptera species, were conducted in 1998 and 2003. Samples were taken within streams, ponds, and wetlands. An exact total number of taxa were not provided within either report. However, the total number of taxa ranged from 25 to 76 in the streams; 32 to 60 in the ponds; and 6 to 30 in the wetlands (USGS, 1998; USACE, 2005).

No biological impairments were identified based on macroinvertebrate community findings. The widespread presence of many coldwater and intolerant macroinvertebrate taxa reflect the undisturbed nature and good resource quality of many of the streams at Camp Ravenna. The caddisfly *Psilotreta indecisa*, state listed as threatened, was collected at several locations. *Stenonema ithica*, state listed species of concern, has also been found at Camp Ravenna. In addition, the midge *Neozavrelia* and the mayfly *Plauditus cestus* were collected for the first time in the state (USACE, 2005). Extension Entomology, Texas A&M University

To obtain further information on taxa observed within the various waterbodies at Camp Ravenna, consult the results of the USGS (1998) *Aquatic Macroinvertebrates Collected at Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio* and the USACE (2005) *Facility-Wide Biological and Water Quality Study 2003 Ravenna Army Ammunition Plant*.

4.3.5 FISH

Surveys for fish were conducted at Camp Ravenna in 1993, 1999, 2003, and 2010 within the streams, ponds, beaver swamps, and small beaver floodings. A total of 47 species of fish were observed within these waterbodies, and two hybrid types (hybrid x sunfish and hybrid x minnow). In 1993, 63 collections were made from 57 sites resulting in 14,422 fish representing 41 species. In 1999, 73 collections were made from 69 sites resulting in 15,301 fish of 34 species, in 2003 collections were made by the USACE resulting in 12,833 fish of 40 species, and in 2010, fish were collected from 60 sites resulting in 17,752 fish of 37 different species. As would be expected, stream habitats supported much greater species diversity (32 species – 1999; 34 species – 2003; 34 species- 2010) than the large beaver swamps (9 species - 1999), ponds and lakes (13 species – 1999; 20 species – 2003; 21 species- 2010), or beaver floodings (13 species) (Rice & Michael, 1999; USACE, 2005; Hoggarth and Rice, 2011). A taxa list of fish at Camp Ravenna is provided in **Appendix D**.

The overall fish community is characteristic of small to medium sized streams, where there is little to no pollution or other habitat modifications. The presence of sensitive pollution intolerant species, such as the state endangered mountain brook lamprey, the redside dace (*Clinostomus elongatus*), the mottled sculpin (*Cottus bairdi*), and the southern redbelly dace (*Phoxinus erythrogaster*), indicates healthy stream habitats and good water quality throughout most of the Camp Ravenna property (Rice & Michael, 1999).

MOTTLED SCULPIN
(PHOTO ODNR)

The 13 fish species associated with the ponds from the 1999 survey were similar to those found in the beaver impoundments. Most ponds supported between three and five species, with one pond (Mack's Pond) supporting only green sunfish. The fish communities found in the Camp Ravenna ponds appear to be primarily the result of intentional and accidental introductions over the years and include species such as the rainbow trout (*Oncorhynchus mykiss*), channel catfish (*Ictalurus puctatus*), and fathead minnows (*Pimphales promelas*) (Rice & Michael, 1999).

The small and large beaver impoundments, while not as diverse as the stream impoundments, have their own characteristic fish community, which is not normally found in either stream conditions or artificial ponds (Rice & Michael, 1999). The fish species commonly associated with the beaver impoundments include bluegill (*Lepomis macrochirus*), green sunfish, pumpkinseed (*Lepomis gibbosus*) warmouth sunfish (*Lepomis gulosus*), largemouth bass, grass pickerel (*Esox americanus vermicula*), central mudminnow (*Umbra limi*) and golden shiner (*Notemigonus crysoleucas*) (Rice & Michael, 1999).

BEAVER, PORTAGE COUNTY, OHIO
(PHOTO BRIAN HERSHBERGER ODNR)

The 2003 study assessed fish communities by calculating an Index of Biological Integrity (IBI) score for each sampling reach. IBI is a metric that was developed to measure the health of a fish community within a stream. It is often the preferred method for assessing aquatic environments because fish are generally longer living and can therefore represent environmental changes over a longer period of time. Fish biological diversity scores in general were similar to the 1993 and 1999 findings. No biological impairments were identified based on these findings (USACE, 2005).

4.3.6 CRAYFISH AND MOLLUSCS

DIGGER CRAYFISH
(PHOTO ODNR)

Four species of crayfish, two aquatic and two terrestrial, are known to exist at Camp Ravenna. The aquatic species, Allegheny crayfish (*Orconectes obscurus*) and White River crayfish (*Procambarus acutus acutus*), were both collected from streams or beaver impoundments of streams. The Allegheny crayfish was abundant and widely distributed across the installation, while the White River crayfish was only rarely encountered and was never abundant. Survey data shows that the aquatic species of crayfish found at the CRJMTC have remained fairly constant over time (Hoggarth & Rice, 2011). The terrestrial species, rock crayfish (*Cambarus bartoni carinirostris*) and digger crayfish (*Fallicambarus fodiens*) are burrowing crayfish that were collected in conjunction with amphibian sampling across the installation (Hoggarth & Hysell, 2000).

Eight species of unionid molluscs were identified in the inventory, three of which were not known to exist in the Mahoning River watershed. These unionid species are common residents of headwaters within Ohio. The creek heelsplitter (*Lasmigona compressa*), a State Species of Concern, was one of the unionid molluscs observed. Ten species of sphaeriid molluscs were identified on the installation, representing all three Ohio genera. Of the twelve species of aquatic gastropods (snails) identified, six were newly identified for the Mahoning River drainage basin. Generally, the diversity of these aquatic species is related to the diversity and density of aquatic plant species. Forty-five (45) species of terrestrial gastropods, including nine new county records, were identified at Camp Ravenna. These terrestrial gastropods represent the largest diversity of molluscs on the installation (Hoggarth & Hysell, 2000; Hoggarth & Rice, 2011) a complete taxa list for the crayfish and molluscs is included in **Appendix D**.

CREEK HEELSPLITTER
(PHOTO USFWS)

4.4 THREATENED AND ENDANGERED SPECIES

The known occurrence of threatened and endangered species is subject to change over time. The change can result from species migration into or out of the area, identification of additional protected species, or a change in status of species currently present at Camp Ravenna.

4.4.1 FEDERAL AND STATE LISTED SPECIES AT CAMP RAVENNA

No federally listed species are known to reside at Camp Ravenna, and no critical habitat occurs. The Northern Long-eared Bat is proposed for listing as an endangered species and is expected to be listed in mid-2015. It does exist at Camp Ravenna. The bald eagle was listed by the United States Fish and Wildlife Agency (USFWS) as a federally threatened species protected by the Endangered Species Act (ESA) of 1973 until 8 August 2007, when it was formally delisted. A nesting pair of bald eagles was discovered in 2010 in forest management compartment 3 at Camp Ravenna.

Several State-listed species have been confirmed by biological surveys to be on the Camp Ravenna property. The ODNR DOW determines the state status of animal species. ORC 1531.25 grants authority to the chief of the ODOW to adopt rules restricting the taking or possession of native wildlife threatened with statewide extirpation and to develop and periodically update a list of endangered species. The first list of Ohio's endangered wildlife was adopted in 1974 and included 71 species. Currently, the list contains nearly 400 species (ODNR, 2012). An extensive examination of the list is conducted every five years, and is developed using input from ODNR staff and other wildlife experts across Ohio.

The ODNR-DNAP determines the status of plant species. ORC 1518.01 grants authority to the chief of the DNAP to designate criteria for identifying and designating species of plants native to Ohio that are in danger of extirpation or are threatened with becoming endangered, and to develop a list of plants, applying the criteria developed. The status list for rare native Ohio plants is revised every two years. State status is determined from records in the Natural Heritage Database and recommendations from the Ohio Rare Plant Advisory Committee. Ohio species designations are defined below.

- **Endangered –** Native species or subspecies threatened with extirpation from the state. The danger may result from one or more causes, such as habitat loss, pollution, predation, inter-specific competition, or disease. This is a legal status designation.
- **Threatened –** Species or subspecies whose survival in Ohio is not in immediate jeopardy, but to which a threat exists. Continued or increased stress will result in its becoming endangered. This is a legal status designation.
- **Species of Concern –** Species or subspecies, which might become threatened in Ohio under continued or increased stress. Also, a species or subspecies for which there is some concern but for which information is insufficient to permit an adequate status evaluation. This category may contain species designated as a furbearer or game species but whose statewide population is dependent on the quality and/or quantity of habitat and is not adversely impacted by regulated harvest. This is an administrative status, not a legal designation.
- **Special Interest –** Species that occur periodically and are capable of breeding in Ohio. It is at the edge of a larger, contiguous range with viable population(s) within the core of its range. These species have no federal endangered or threatened status, are at low breeding densities in the state, and have not been recently released to enhance Ohio's wildlife diversity. With the exception of efforts to conserve occupied areas, minimal management efforts will be directed for these species because it is unlikely to result in significant increases in their populations within the state. This is an administrative status, not a legal designation.
- **Potentially Threatened –** A native Ohio plant species may be designated potentially threatened if one or more of the following criteria apply: 1) the species is extant in Ohio and does not qualify as a state endangered or threatened species, but it is a proposed federal endangered or threatened species or a species listed in the Federal Register as under review for such proposal; 2) the natural populations of the species are imperiled to the extent that the species could conceivably become a threatened species in Ohio within the foreseeable future; or 3) the natural populations of the species, even though they are not threatened in Ohio at the time of designation, are believed to be declining in abundance or

vitality at a significant rate throughout all or large portions of the state. This is an administrative status, not a legal designation.

Table 13 presents a list of rare bird species observed, but not known to nest, at Camp Ravenna, while **Table 14** provides a list of rare species that nest or reside at Camp Ravenna (see **Figure 11,** for rare species observation points). Both tables were compiled from the results of the updated species inventories, dated 28 August 2006, subsequent observations and studies, and correspondence with applicable agencies (Morgan *pers. comm.*, 2006; USFWS, 2005; DNAP, 2005; ODOW, 2002).

TABLE 13: RARE BIRD SPECIES OBSERVED BUT NOT KNOWN TO NEST AT CAMP RAVENNA

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	FEDERAL STATUS
American bittern	*Botaurus lentiginosus* (migrant)	E	-
Dark-eyed junco	*Junco hyemalis* (migrant)	SI	-
Great Egret	*Ardea alba* (migrant)	SC	-
Hermit thrush	*Catharus guttatus* (migrant)	SI	-
Sandhill Crane	*Grus canadensis*	E	-
Trumpeter swan	*Cygnus buccinator* (migrant)	T	-

FEDERAL STATUS
E = Endangered (Danger of extinction throughout range)
T = Threatened (Likely to become endangered in foreseeable future throughout range)
C = Federal Candidate

OHIO STATUS
E = Endangered
T = Threatened
P = Potentially Threatened
(Administrative status; not a legal designation)
SC = Species of Concern
SI = Special Interest (Administrative status; not a legal designation)

Source: Camp Ravenna Surveys; USFWS; Ohio DNR

TABLE 14 : RARE SPECIES THAT NEST OR RESIDE AT CAMP RAVENNA

GROUP	COMMON NAME	SCIENTIFIC NAME	STATUS	GROUP	COMMON NAME	SCIENTIFIC NAME	STATUS
Bird				Insect	Brush-tipped emerald	*Somatochlora walshii*	E
	American bittern	*Botaurus lentiginosus*	E		Caddisfly	*Psilotreta indecisa*	T
	American Black Duck	*Anas rubripes*	SI		Graceful underwing	*Catocala gracilis*	E
	Barn owl	*Tyto alba*	T		Mayfly	*Stenonema ithica*	SC
	Blackburnian warbler	*Dendroica fusca*	SI		Moth	*Apamea mixta*	SC
	Black-throated blue warbler	*Dendroica caerulescens*	SI		Moth	*Brachylomia algens*	SC
	Bobolink	*Dolichonyx oryzivorus*	SC		Scurfy quaker	*Homorthodes furfurata*	SC
	Brown creeper	*Certhia americana*	SI		Subflava sedge borer	*Capsula subflava*	SI
	Canada warbler	*Wilsonia canadensis*	SI	Mammal	Big brown bat	*Eptesicus fuscus*	SC
	Cerulean warbler	*Dendroica cerulea*	SC		Black Bear	*Ursus americanus*	E
	Common moorhen	*Gallinula chloropus*	SC		Bobcat	*Felis rufus*	T
	Dark-eyed junco	*Junco hyemalis*	SI		Deer mouse	*Peromyscus maniculatus*	SC
	Gadwall	*Anas strepera*	SI		Eastern red bat	*Lasiurus borealis*	SC
	Golden-crowned kinglet	*Regulus satrapa*	SI		Hoary bat	*Lasiurus cinereus*	SC
	Golden-winged warbler	*Vermivora chrysoptera*	X		Little brown bat	*Myotis lucifugus*	SC
	Great egret	*Ardea alba*	SC		Northern long-eared bat	*Myotis septentrionalis*	SC
	Green-winged teal	*Anas crecca*	SI		Pygmy shrew	*Sorex hovi*	SC
	Henslow's sparrow	*Ammodramus henslowii*	SC		Southern Bog Lemming	*Svnaptomys cooperi*	SC
	Hermit thrush	*Catharus guttatus*	SI		Star-nosed mole	*Condylura cristata*	SC
	Least bittern	*Ixobrychus exilis*	T		Tri-colored bat	*Perimyotis subflavus*	SC
	Least flycatcher	*Empidonax minimus*	SI		Woodland jumping mouse	*Napaeozapus insignis*	SC
	Magnolia warbler	*Dendroica magnolia*	SI	Mussel	Creek heelsplitter	*Lasmigona compressa*	SC
	Marsh wren	*Cistothorus palustris*	SC	Plants (Bryophyte)	Lurking leskea	*Plagiothecium latebricola*	T
	Mourning warbler	*Oporornis philadelphia*	SI		Narrow-necked Pohl's moss	*Pohlia elongata* var. *elongata*	E
	Northern bobwhite	*Colinus virginianus*	SC		Tufted Moisture-loving moss	*Philonotis fontana* var. *caespitosa*	E
	Northern harrier	*Circus cyaneus*	E	Plants (vascular)	Appalachian quillwort	*Isoetes engelmannii*	E
	Northern shoveler	*Anas clypeata*	SI		Arborvitae*	*Thuja occidentalis*	P
	Northern waterthrush	*Seiurus noveboracensis*	SI		False hop sedge	*Carex lupuliformis*	P
	Pine siskit	*Carduelis pinus*	SI		Greenwhite sedge	*Carex albolutescens*	P
	Prothonotary warbler	*Protonotaria citrea*	SC		Handsome sedge	*Carex formosa*	E
	Purple finch	*Carpodacus purpureus*	SI		Hobble-bush	*Viburnum alnifolium*	T
	Red-breasted nuthatch	*Sitta canadensis*	SI		Long beech fern	*Phegopteris connectilis*	P
	Redhead duck	*Aythya americana*	SI		Pale sedge	*Carex pallescens*	P
	Ruddy duck	*Oxyura jamaicensis*	SI		Philadelphia panic-grass	*Panicum philadelphicum*	E
	Sandhill crane	*Grus canadensis*	SE		Sharp-glumed manna-grass	*Glyceria acutifolia*	P
	Sedge wren	*Cistothorus platensis*	SC		Shinning ladies-tresses	*Spiranthes lucida*	P
	Sharp-shinned hawk	*Accipiter striatus*	SC		Simple willow-herb	*Epilobium strictum*	T
	Sora rail	*Porzana carolina*	SC		Straw sedge	*Carex straminea*	P
	Trumpeter swan	*Cygnus buccinator*	ST		Strict blue-eyed grass	*Sisyrinchium montanum*	T
	Virginia rail	*Rallus limicola*	SC		Variegated scouring-rush	*Equisetum variegatum*	E
	Wilson's Snipe	*Gallinago delicata*	SI		Water avens	*Geum rivale*	P
	Winter wren	*Troglodytes troglodytes*	SI		Woodland horsetail	*Equisetum sylvaticum*	P
	Yellow-bellied sapsucker	*Sphyrapicus varius*	SC	Reptiles	Eastern garter snake	*Thamnophis sirtalis*	SC
Amphibians	Eastern box turtle	*Terrapene carolina*	SC		Smooth green snake	*Opheodrys vernalis*	SC
	Four-toed salamander	*Hemidactylium scutatum*	SC	**OHIO STATUS:** E = Endangered, T = Threatened, SC = Species of Concern**, SI = Special Interest**, P = Potentially Threatened**, X = Extirpated			
Fish	Eastern sand darter	*Ammocrypta pellucida*	SC	**Administrative status; not a legal designation			
	Mountain brook lamprey	*Ichthyomyzon greeleyi*	E				

Source: USFWS, 2014; DNAP, 2014; ODOW, 2012; BHE, 2012

*Arborvitae was planted on site and does not occur naturally within the facility.

4.4.2 OTHER BIOLOGICAL ITEMS OF INTEREST

Additional biological items of interest have also been identified through agency consultation and coordination with installation natural resources personnel. These items include:

Turkey Vulture (*Cathartes aura*) Roosts - turkey vultures roost and breed throughout Camp Ravenna, primarily on and around earth covered magazine headwalls, under elevated loading docks, and abandoned buildings.

Great Blue Heron - Up to three heron rookeries have been identified at Camp Ravenna in a given year. The rookeries are normally small and are abandoned for better areas from time to time.

4.4.3 SPECIAL INTEREST AREAS

DoD Instruction 4715.03 allows Army installations to recognize special interest ecosystems that are not federally protected. A Special Interest Area is not a legal designation, simply a way for the installation to recognize noteworthy resources and identify them for special management and attention. Special Interest Areas include communities that host State-listed species, are representative of historic ecosystems, and/or are otherwise noteworthy. The OHARNG has identified five Special Interest Areas at Camp Ravenna; these areas are identified on **Figure 11** and described below.

4.4.3.1 UNIT 1 (APPROXIMATELY 1,510 ACRES)

This unit covers a very large area and contains a diverse array of plant communities supporting many plant and animal species. In addition to the area originally designated by Andreas (1993), this unit includes the Erie burning ground beaver ponds, North Patrol Pond, additional swamp forest, and more of the South Fork Eagle Creek basin. These areas were added because of their importance to wildlife, rare plant species, and making the area a more functional ecosystem. This unit surrounds Unit 2 (Wadsworth Glen). The boundaries are hayfields on either side of Paris-Windham Road.

BEECH MAPLE FOREST (PHOTO USDA FOREST SERVICE)

Plant communities: Forested communities include beech-sugar maple forest, Oak-Maple swamp forest, mixed swamp forest, oak-maple-tuliptree forest, oak-hickory forest, mixed floodplain forest, and successional woods. Wetland communities include floating-leaved marsh, submergent marsh, emergent marsh, cattail marsh, Sedge-Grass meadow, mixed shrub swamp, buttonbush swamp, shrub bog, wet fields, ponds, and disturbed wetlands.

State-listed plant species: Long Beech Fern (*Phegopteris connectilis*) and Lurking Leskea (*Plagiothecium latebricola*).

Noteworthy plant species: Blunt Mountain-Mint (*Pycnanthemum muticum*), Closed Gentian (*Gentiana clausa*), Emmon's Sedge (*Carex albicans* var. *emmonsii*), Brown Bog Sedge (*Carex buxbaumii*), Inland Sedge (*Carex interior*), Long Stalked Sedge (*Carex pedunculata*), Beaked Sedge (*Carex utriculata*), Long-Leaved Summer Bluets (*Houstonia longifolia*), Goldenseal (*Hydrastis canadensis*), Meadow Sundrops (*Oenothera pillosella*), American Ginseng (*Panax quinquefolius*), Marsh Clearweed (*Pilea fontana*), Northern Fox Grape (*Vitis labrusca*), Pale Manna Grass (*Puccinellia pallida*), Pediceled Wool-Grass (*Scirpus pedicellatus*), Poison Sumac (*Toxicodendron vernix*), Starflower (*Trientalis borealis*), and Woodland-horsetail (*Equisetum sylvaticum*).

BLUNT MOUNTAIN MINT (PHOTO SB_JOHNNY)

State-listed animal species: Four Toed Salamander, Mountain Brook Lamprey, Woodland Jumping Mouse, Sora, Virgina Rail, and Yellow-Bellied Sapsucker.

4.4.3.2 UNIT 2 (APPROXIMATELY 104 ACRES)

This area, known as Wadsworth Glen, is one of the most important natural areas in northeastern Ohio. Wadsworth Glen is an aesthetically attractive area because of the steep rock walls, hemlocks, and ferns. South Fork Eagle Creek once cut through the area with such force that it cut deep ravines into the Sharon conglomerate sandstone. The Sharon conglomerate rock walls average between about 40 to 60 feet high. Two significant plant communities occur in the Glen, hemlock-white pine-hardwood forest and non-calcareous cliff. According to Andreas (1993), white pine was once a component of the forest community but, as in other sites in Ohio, it has been removed by logging. Recently, this community was renamed hemlock-hardwood forest for Ohio communities, since white pine is no longer a component (OHARNG, 2001).

BUTTERNUT
(PHOTO ODNR)

Plant communities: Forested communities include hemlock-hardwood forest, oak-hickory forest, and mixed floodplain forest. Wetland communities include floating-leaved marsh, submergent marsh, emergent marsh, cattail marsh, and ponds. Other communities include non-calcareous cliff (Anderson, 1982), dry fields, and a quarry.

State-listed plant species: Long Beech Fern (*Phegopteris connectilis*) and Hobblebush (*Viburnum alnifolium*).

Noteworthy plant species: Closed Gentian, Mountain-Maple (*Acer spicatum*), Spikenard (*Aralia racemosa*), American Chestnut (*Castanea dentata*), Pasture Thistle (*Cirsium pumilum*), Flattened Wild Oat Grass (*Danthonia compressa*), Canadian Fly-Honeysuckle (*Lonicera canadensis*), Red Berried Elderberry (*Sambucus pubens*), Starflower, Wake-Robin (*Trillium erectum*), Eel-Grass (*Vallisineria americana*), and Round-Leaved Violet (*Viola rotundifolia*).

State-listed animal species: None.

4.4.3.3 UNIT 3 (APPROXIMATELY 706 ACRES)

This unit contains some stands of mature woods. The most significant stand of trees occurs at the northeastern portion of the unit. This is an approximately 50-acre mature stand of oak-maple-tuliptree forest. In addition, mature stands of beech-sugar maple forest occur near Sand Creek. This unit also includes areas of successional woods in former clearcuts and agriculture fields.

Plant communities: Mixed swamp forest, beech-sugar maple forest, oak-maple-tuliptree forest, red maple woods, successional woods, cattail marsh, and disturbed habitats.

State-listed animal species: Mountain Brook Lamprey and Barn owl.

4.4.3.4 UNIT 4 (APPROXIMATELY 149 ACRES)

This unit contains a large number of rare plants and a mature stand of mixed swamp forest. The mixed swamp community is dominated by pin oak (*Quercus palustris*). Other species include swamp white oak, northern red oak (*Quercus rubra*), and beech (*Fagus grandifolia*).

PIN OAK LEAF
(PHOTO ODNR)

In addition, one of the most diverse areas at Camp Ravenna is the scalped field on either side of B&O Wye Road. The site was disturbed severely during the early construction of roads on the property. This area supports at least 140 species of plants including five that are state listed. The seeps and swales support many wetland plants, including round-leaved sundew and large cranberry. Sphagnum moss is common near B&O Wye Road, forming a bog-like area.

ROUND-LEAVED SUNDEW
(PHOTO USDA FS, RICK TURNER)

Plant communities: Sphagnum (*Sphagnum* spp.) thicket, oak-maple swamp forest, mixed swamp forest, dry fields, buttonbush swamp, wet meadows, cattail marsh, a pond, and seeps.

State-listed plant species: Straw Sedge (*Carex straminea*) and Simple Willow-Herb (*Epilobium strictum*).

Noteworthy plant species: Blunt Mountain-Mint, Large Cranberry (*Vaccinium macrocarpon*), Weak Sedge (*Carex debilis* var. *debilis*), Ridged Yellow Flax (*Linum striatum*), Round-Leaved Sundew (*Drosera rotundifolia*), and Little Ladies'-Tresses (*Spiranthes tuberosa*).

State-listed animal species: Graceful Underwing (*Catocala gracilis*).

4.4.3.5 UNIT 5 (APPROXIMATELY 206 ACRES)

This unit is located north of South Patrol Road, about 0.4 mile west of the junction of South Service Road and Greenleaf Road. This unit is a mosaic of plant communities. It contains a relatively mature stand of mixed swamp forest that grades into oak-maple swamp forest and beech-sugar maple forest. The mixed swamp forest contains numerous scattered small swamps. Sphagnum moss hummocks are common in these swamps. The maturity of the trees, the many small swamps, and the relative intact condition of the communities make this area a Special Interest Area.

BUTTONBUSH
(PHOTO INDIANA DNR)

Plant communities: Mixed swamp forest, oak-maple swamp forest, beech-maple forest, buttonbush swamp, open swamps.

State-listed plant species: False Hop Sedge (*Carex lupuliformis*).

SECTION 5: MISSION IMPACTS ON NATURAL RESOURCES

5.1 CURRENT POTENTIAL TRAINING IMPACTS

5.1.1 MINIMUM IMPACT TRAINING

Types of training activities that generally have a minimal impact on natural resources at Camp Ravenna include: small unit infantry tactics; reconnaissance; terrain and map analysis; escape and evasion tactics; infiltration tactics; land navigation; patrolling; wheeled and tracked vehicle convoy route/driver training; tracked vehicle maneuver training on established tank trails; tank gunnery training on the Tank Table II MILES Range; and engineer maintenance, repair, and minor construction project training. Some of these types of training require undisturbed cover to conceal movements and others utilize existing roads, hardened trails, and infrastructure. As such, this type of training usually results in disturbance is no greater than walking through the woods or open areas or driving down a road, and would normally require no extraordinary precautions, limitations or restrictions. Minor troop construction does cause disturbance and is vetted through the NEPA process.

Aviation training (nap of the earth, hot and cold refueling, sling load, aerial drop, and simulated aerial spray training) is also considered minimum impact training. Aviation operations tend to be of short duration and relatively quick moving. Based on bird and other biological survey data, there are no negative impacts on bird populations or any other wildlife population. The dense vegetative cover throughout Camp Ravenna prevents dust and soil erosion problems associated with rotor wind.

Most minimum impact training does not involve habitat manipulation or cutting of vegetation three inches in diameter or larger and therefore is not expected to impact Indian bat, northern long-eared bats, other bats species or any other federally listed species. Training that does disturb habitat or requires earth movement requires NEPA analysis. Impacts from these types of training are reviewed on a case by case basis.

5.1.2 MAXIMUM IMPACT TRAINING

Some types of training disturb soils, vegetation or both. Secondary impacts to the soil and water resources may affect water quality, fish populations and wildlife. Such disturbances may require corrective and/or preventative actions such as leveling ruts, adding soil, seeding, mulching, and/or installation of erosion control devices, sedimentation structures, or other management practices. These types of training are confined to specific training areas designed to facilitate the training and may require NPDES discharge permits issued by the Ohio EPA.

The types of training activities that have the potential for causing soil or vegetation disturbance that are conducted at Camp Ravenna include: tactical concealment/bivouac; off-road cold or wet weather operations; certain cover and concealment training; field fortifications; breaching and clearing operations; obstacle training; cut, fill and haul (horizontal) operations; Engineer Equipment and Heavy Maneuver training; off road maneuver training; demolition training; non-standard bridge construction; mobility and counter mobility operations; and major construction activities (military and contracted civilian).

Environmental impacts from these types of training are evaluated in NEPA reviews. Management principles in the INRMP are used to avoid, minimize and mitiage impacts.

5.2 POTENTIAL FUTURE IMPACTS

As the maneuver areas and TAs at Camp Ravenna expand, this document and the expertise of the Camp Ravenna Environmental Office may be used to identify the areas that are best suited for certain types of training. Future mission planning requirements can be determined through a multidisciplinary team approach that identifies resource management goals, establishes management objectives to meet those goals, and then determines specific practices that can be implemented to achieve the objectives and goals. Since the INRMP is a living document, specific natural resources in specific areas may be

addressed, modifying or adding to existing goals and objectives of the INRMP, and the document updated as needed.

The ultimate goal of this INRMP, as well as its subsequent additions or revisions, is to ensure continuous military training capability for the OHARNG, while managing for the mutual sustainability of the natural resources at Camp Ravenna. The development and implementation of an active ecosystem management program will accommodate the OHARNG's training mission, while emphasizing a holistic, adaptive management style that focuses on maintaining biological diversity. Future development of Camp Ravenna to meet the training needs of the OHARNG is summarized in **Section 2.4.1.12**. The primary environmental impacts associated with training site development will be to soil, wetlands, and surface water arising from construction of ranges, buildings, tank trails and Engineee equipment and tactical off-road maneuver training. The most critical regulatory issues and challenges are the potential impacts to surface water and wetland resources. Specific impacts from training site development have been reviewed in a separate NEPA document.

Natural resource management techniques, policies, and procedures identified in this plan will be used to facilitate development for military training while minimizing environmental impacts. It's anticipated that up to 1000 acres may be disturbed during training site development. In addition, the entire 21,683 acres of Camp Ravenna are available to support training of one type or another within the capability of the land. Jurisdictional wetland delineations and archeological surveys will be completed prior to any land disturbing development. These surveys, along with general natural resource management practices identified in this plan, will enable the OHARNG to successfully develop the training site to meet mission requirements. Adequate advance planning and design in support of training site development will minimize impacts from the military mission on natural resources and provide for long term sustainability of the land to support training.

Once the training site is fully developed, the ongoing training may result in some vegetation and soil disturbance. Disturbance will be due to activities such as bivouacking, tactical concealment, fox holes, tank trenches, and off road foot and vehicle traffic. The training site will be managed in accordance with the land and ecosystem ability to support such disturbance. In TAs receiving high amounts of disturbance, erosion control measures, such as silt basins and vegetative filter strips, will be implemented. Soil disturbance will be monitored and land rehabilitation projects initiated to restore damaged areas. Disturbed areas will be leveled and vegetated and the areas rested until capable of supporting training again. Training also has the potential to impact wetlands and cultural sites. These areas will be delineated and designated as restricted access areas, or other training-related obstacles, as a way to keep them from being disturbed. When wetlands cannot be avoided, permits will be obtained and mitigation completed. Off road vehicle traffic is permitted in accordance with soil conditions. Tracked vehicle trails and roads are regularly used and off road traffic is permitted on a site-specific basis when the soil conditions are conducive to support such traffic. Disturbance to vegetation is expected to be minor. Hardened bivouac sites are used when possible, and troops are not permitted to cut standing trees for cover. Other techniques, such as covering tree root areas with mulch can be used to minimize soil compaction and root damage in heavily trafficked areas. Once the training site is fully developed and managed, the actual military training is anticipated to have minimal, if any, negative impacts on natural resources.

Non-training activities that disturb natural resources include facility maintenance and new construction. Maintenance consists of vegetation control (mostly mowing) around active fence lines, power lines, railroad tracks, roadside ditches, buildings, active ECMs, road surfaces, parking lots, ranges, ponds, and wildlife management areas. Herbicides are used to augment and support vegetation control efforts and in areas where mowing is not possible or appropriate. Controlled burning is used on ranges to maintain grassland habitat conducive to range operations and occasional in other areas exclusively for grassland habitat management. Controlled burns are usually done in conjunction with local fire departments and with OHARNG fire units as a training mission whenever possible. New construction has a permanent impact on natural resources by totally modifying the landscape within the construction zone and where the structure or facility is constructed. Construction has the potential for temporary impacts to soil and surface water quality from erosion. Impacts are expected to be negligible because

Camp Ravenna has such vast habitat, projects are sited in areas with the least potential for negative impact to the environment, and erosion control measures are implemented during construction. The Army IRP involves environmental media sampling, building demolition, and earth excavation. Occasionally, small amounts of timber must be salvaged as part of a demolition or construction project. All operations are done in accordance with the requirements of this plan and soil erosion control and stabilization practices are used. All bare earth areas are seeded with native grass seed mixes. No long term negative impacts to natural resources are anticipated due to restoration activities (Tadsen and Morgan *pers comm*., 2005).

5.3 NATURAL RESOURCES NEEDED TO SUPPORT THE MILITARY MISSION

The OHARNG requires a mixture of open and forested land areas to support military training requirements. Realistic training is dependent upon an intact natural setting. Degraded training lands, soil erosion, degraded forests, silted streams, and flooded training areas would prevent sustainable long-term training. Degradation of natural resources results in inadequate training, impaired readiness, and wasted training dollars. Maintaining healthy ecosystems keeps the training land continuously available for use by soldiers. Healthy ecosystems are resilient and can support long term training needs. The OHARNG needs the land and its natural resources to function together in a healthy ecosystem to support training.

Missionscape refers to the condition of the landscape best suited to support the various training missions and varies depending upon the type of training. The terrain at Camp Ravenna is mostly mixed hardwood forest broken up by a network of roads, trails, and abandoned railroad beds. There are scattered brushy grown up old farm fields (ranging from five to 100 or more acres), some grasslands, and multiple small ponds and wetland areas. The grasslands are mostly on the ranges, drop zone and training areas maintained in grass for bivouacking. There are abandoned administrative areas and an old housing area at Camp Ravenna, which provide an urban missionscape. The training site also contains an extensive road and railroad bed network that provides trails for tracked and wheeled vehicle maneuvers.

All the landscapes at Camp Ravenna are important in supporting training activities. Military training is done in conjunction with the existing landscape and when necessary the landscape is modified to better support the training mission needs, such as restoring grassland for range development. The ideal missionscape for Camp Ravenna would consist of healthy mature forests with a mixture of grassland and other open/brushy vegetated areas; roads, railroad beds, and buildings free of beaver flooding; large open areas with only scattered trees and brush; and urban areas not overgrown with vegetation. Management activities in this INRMP are designed to support the desired type of natural landscapes.

A mixture of mature forests with a mixed open and vegetated understory, poletimber stands, brushy fields, and wet areas are needed to support small unit infantry tactics, force on force operations, reconnaissance, terrain and map analysis, escape and evasion tactics, land navigation, and tactical concealment/bivouac training.

Ranges require mostly grasslands but brushy fields and forested areas are acceptable outside of the line of sight to targets on some ranges. The majority of range impact areas are managed secondary as grasslands at Camp Ravenna.

Open grasslands, roads, trails, railroad beds, and former ammunition production areas are required for wheeled and tracked vehicle driver, maneuver, and convoy training. The mixture of forest, shrub land, and urban areas provide a diverse environment for convoy ambush training, military police (MP) training, and MOUT training. The roads, trails, railroad beds, and urban areas must be kept free form beaver flooding to be usable for training. Open grasslands and former ammunition production areas provide locations for off road tactical vehicle maneuver and must be managed to prevent soil erosion and soil and water degradation. Urban areas have a tendency to get overrun with brush and poison ivy. Vegetation control must be implemented to maximize usability of these areas.

Specific areas have been designated for engineer equipment training. These areas are grasslands or old fields cleared with sedimentation and erosion controls measures put in place and are used as earth moving sites. When not in use, they are maintained as grasslands. When in use, they are free of vegetation.

Aviation nap of the earth training requires mixed levels of vegetation from mature forest to open wetland areas, brushy fields, grasslands, roads, and areas with buildings. Aviation hot and cold refueling training requires upland open grassy areas with road access. Aerial drop training and parachute operations require large open grasslands. Aerial sling load training and simulated aerial spray training require large remote tracts of land. The large unoccupied mixed forested areas of Camp Ravenna are ideal for this training. The sling load training also requires open grasslands with road access for hooking up the sling loads. Aviation training also needs a deep pond or large holding tank to practice filling a bambi bucket. This asset is currently not available at Camp Ravenna.

Ranges require surface danger zones (SDZs). The size of the SDZ depends upon the weapon and ammunition type being fired on the range. Large tracks of land with no inhabitated buildings are needed for the ranges at Camp Ravenna. The ASP, CE Stoerage and tenant ECM storage also have safety buffers of uninhabitated land around them. These safety areas can be occupied by any of the natural vegetation and habitats at Camp Ravenna.

5.4 NATURAL RESOURCES CONSIDERATIONS FOR MISSION PLANNING AND INITIATION

The ultimate goal of this INRMP is to ensure the sustainability of doctrinally-required military training at Camp Ravenna, while providing for conservation of the installation's natural resources. Training success at Camp Ravenna is only possible through a supportive, proactive natural resource management program. The Camp Ravenna natural resource management program aims to minimize the impacts of normal training use on Camp Ravenna natural resources, and complements the doctrinally required military training conducted on the installation. Proper execution of the INRMP provides sustainable training lands, and provides adaptive means of dealing with normal training impacts, thereby protecting our natural resources. Many features of this plan contribute to its ability to provide sustainable training lands. Some of these features are techniques, practices and procedures, which include immediate repair and restoration of terrain damage, "resting" repaired terrain while vegetation is re-established, minimizing off-road vehicle activity when soil is saturated, posting wetlands as no-go areas, and establishing rotational use of field bivouac sites. Other features provide for "hardening" of areas frequently used for training, to minimize impacts on natural resources within the surrounding areas. Permanent stream crossing sites are another example of these best management practices (BMP), which minimize damage to vegetation, soil loss, erosion, and sedimentation. Natural resources management will facilitate the accomplishment of the military mission.

Refer to **Sections 6.3** through **6.16** for additional information on how to properly manage these natural resources limitations during mission planning. Laws and regulations that pertain to these natural resources are also incorporated into **Appendix E**.

The OHARNG has reviewed our training activities and evaluated potential impacts to federally listed rare species and obtained USFWS concurrence regarding management and restrictions required to comply with the ESA. This review is found in **Appendix J** and is used as management guidance in relation to federally listed species. The appendix also identifies Bald Eagle management strategies/restrictions. The review is updated as mission operations and/or federal species listings change.

SECTION 6: NATURAL RESOURCES PROGRAM MANAGEMENT

6.1 NATURAL RESOURCES PROGRAM MANAGEMENT

Intra- and inter-agency cooperation, coordination, and communication at the Federal, State and local levels (for example, USFWS and ODNR) are requisite to the success of the INRMP. The USFWS and ODNR review and are signatory to the INRMP. The OHARNG-ENV has a strong relationship with such groups. Specialized expertise is required to adequately manage natural resources at Camp Ravenna. Technical assistance should be sought from Federal and State agencies, universities, and other conservation organizations and agencies as necessary.

6.1.1 ADMINISTRATIVE AND TECHNICAL SUPPORT

The Natural Resources Program at Camp Ravenna is administered by the OHARNG-ENV personnel at the Camp Ravenna Environmental Office. Responsibilities of the OHARNG-ENV in regard to this INRMP include:

- Implementing this INRMP;
- Providing oversight and coordination with other agencies;
- Developing and implementing programs to ensure the inventory, delineation, classification, and management of all applicable natural resources to include: forests, wetlands, endangered and threatened species, sensitive or unique habitats, and other natural resource areas of special interest
- Providing for the training of natural resources personnel;
- Maintaining natural resources management records;
- Reviewing environmental documents (for example environmental impact assessments and remedial action plans) and construction designs and proposals to ensure adequate consideration of natural resources, while ensuring that technical guidance as presented in this INRMP is adequately considered;
- Evaluating impacts of training missions and providing guidance to trainers;
- Coordinating the Cultural Resources program and Section 106 compliance;
- Coordinating with local, State, and Federal governmental and civilian conservation organizations relative to the Camp Ravenna natural resources management program;
- Coordinating hunting and fishing program;
- Implementing and executing AR 200-1; and
- Assisting the Adjutant General with developing funding priorities for all natural resources program and compliance activities.

The OHARNG-ENV also receives support from the Camp Ravenna staff, each of whom has significant duties in addition to natural resources support. Additional labor resources may include:

- Federal agencies (for example, USFWS, NRCS, USACE, and the AEC);
- State agencies;
- Local and regional Universities;
- Scouting groups; and
- Conservation groups (for example, The Nature Conservancy (TNC), and sportsmens' clubs).

6.1.2 COOPERATIVE AGREEMENTS

6.1.2.1 FEDERAL AGREEMENTS

The DoD and subcommand entities have Memorandums of Understanding (MOU), Memorandums of Agreement (MOA), and other cooperative agreements with other federal agencies, conservation and special interest groups, and various state agencies in order to provide assistance with natural resources management at installations across the U.S. Generally, these agreements allow installations and agencies or conservation and special interest groups to obtain mutual conservation objectives. The DoD agreements applicable to Camp Ravenna include:

- MOU between DoD and the USFWS concerning ecosystem-based management of fish, wildlife, and plant resources on military lands;
- Cooperative Agreement between the DoD and TNC for assistance in natural resources inventory;
- MOA for Professional and Technical Assistance Conducting Biological Surveys, Research and Related Activities between the DoD and the National Biological Service of the Department of the Interior;
- MOU between the DoD and the USEPA in respect to Integrated Pest Management (IPM);
- MOA for Federal Neotropical Migratory Bird Conservation Program and addendum ("Partners in Flight-Aves De Las Americas") among DoD, through each of the Military Services, and over 110 other Federal and State agencies and non-governmental organizations;
- MOU between the U.S. Army Environmental Center and the U.S. Department of Agriculture (USDA), NRCS for Watershed and Environmental Enhancement of U.S. Army Installations;
- MOU between the DoD and Ducks Unlimited, Inc. to provide a foundation for cooperative development of selected wetlands and associated uplands in order to maintain and increase waterfowl populations and to fulfill the objectives of the North American Waterfowl Management Plan, within the context of DoD's environmental security and military missions; and
- MOU for Watchable Wildlife Programs.

6.1.2.2 STATE AGREEMENTS

OHARNG has an MOA in place with the Ohio DNR to facilitate annual aerial surveys of the deer populations. Other MOAs have been entered intoin the past for specific purposes such as conducting biological surveys. The Camp Ravenna INRMP is reviewed and concurred with by the Ohio DNR and Ohio DOW and in a sense functions as a cooperative agreement. It is a cooperative plan that identifies how the Ohio DNR and Ohio DOW and the OHARNG will work together to meet mutual conservation objectives.

6.2 GEOGRAPHIC INFORMATION SYSTEMS

Natural resources Geographic Information Systems (GIS) data are maintained by OHARNG GIS Manager at Beightler Armory in Columbus, OH. Natural resources GIS data is currently not well managed. A dedicated GIS staff member is needed at Camp Ravenna to manage NR GIS data and other GIS data as well to provide special data analysis and map making capabilility necessary for planning and training site management.

Currently, the OHARNG has electronic data files for the following natural resources on Camp Ravenna.

- Topography (Digital Raster Graphics [DRG], Digital Elevation Model [DEM], contours).
- Elevation contours are derived from USGS DEMs converted into contours (Digital Line Graphics [DLG]).

- Aerial (Digital Ortho Quarter Quads [DOQQ]) – Various years and resolution.
- Soils (USDA Soil Survey Geographic Database [SSURGO]); Soil survey data is obtained from the NRCS. Portage county soil data is from 2006 (SSURGO, 2006), and Trumbull County soil data is from 1999 (SSURGO, 2000).
- Open water; Waterbodies are derived from USGS surveys and aerial photos. Additional water body data is derived from on-site surveys.
- Wetlands (revised-2013); Wetland data is derived from contracted on-site wetland surveys and spatial data are provided from contractors with the individual reports.
- National Wetlands Inventory (NWI); derived from USGS surveys of aerial photography.
- 100-year floodplain; derived from topography data and DEMs, and are designated (preliminarily) by the USGS. Other agencies and organizations can do more detailed floodplain delineations periodically.
- Terrestrial communities; Derived from USGS aerial photo surveys in conjunction with sparse field surveys.
- Rare flora and fauna species; Derived from specific contracted species surveys on site.
- Fauna - Derived from specific contracted species surveys on site.

In addition, the OHARNG has electronic data files for the following:

- Installation boundary; A surveyor surveyed the boundaries of Camp Ravenna in 2002.
- Roads; Derived initially from USGS or U.S. Census data and further modified to match current conditions by OHARNG staff. Historic road layers also exist.
- Range berms; Developed by OHARNG staff and contractors as needed thru field surveillance.
- Firing positions; Developed by OHARNG staff and contractors as needed thru field surveillance.
- Range towers; Developed by OHARNG staff and contractors as needed thru field surveillance.
- Firing range SDZ boundaries; Developed by OHARNG staff and contractors as needed thru field surveillance.
- Concrete; Developed by OHARNG staff and contractors as needed thru field surveillance.
- Helipads; Developed by OHARNG staff and contractors as needed thru field surveillance.
- Demographics - Census TIGER data.
- Noise Contours.
- Buildings.
- Utilities including water, electric, stormwater, communication lines, and easements.
- Recreational areas.
- Environmental restoration sites.
- Photo Points.
- Timber harvest areas.
- Storage tanks.
- Fences and Gates.

6.3 FISH AND WILDLIFE MANAGEMENT

Since support of doctrinally required military training is the primary mission of Camp Ravenna, fish and wildlife management programs will be accomplished through direct coordination with the TSC. Fish and wildlife management at Camp Ravenna will protect, conserve, and regulate fish and wildlife populations, including State-listed threatened and endangered species, using modern scientific principles. This management will be conducted in a manner consistent with all applicable laws and regulations and in coordination with state and federal wildlife management agencies. The OHARNG will maintain optimum and diverse fish and wildlife habitat by integrating fish and wildlife management strategies with other ecosystem management activities such as training area and forest management. Some laws and regulations pertaining to fish and wildlife management include:

- Bald Eagle Protection Act (16 USC §668a-d);
- CWA (33 USC §1341);
- EO 11990, Protection of Wetlands;
- EO 11988, Floodplain Management;
- ESA, 7 U.S.C. 136;16 U.S.C. 460 et seq. (1973) as amended;
- Fish and Wildlife Conservation Act (USC §2901 et seq.);
- Fish and Wildlife Coordination Act, as amended (16 USC §661 et seq.);
- Migratory Bird Treaty Act, as amended (16 USC §703-712);
- NEPA (42 USC §4321 et seq.);
- SAIA (16 USC §670a-o);
- ORC § 1531.25, Protection of species threatened with statewide extinction;
- ORC § 1533, Fish and Hunting; and
- OAC 1501:31-13-01,-02,-15, Sport fishing, Migratory game birds, and hunting and trapping.

These laws and regulations are described in **Appendix E.**

6.3.1 COOPERATIVE WILDLIFE MANAGEMENT EFFORTS

Camp Ravenna works closely with the ODOW in the management of fish and wildlife resources on the installation and public access programs for hunting, fishing, and trapping. The ODOW is the state agency that manages hunting, fishing, and trapping and rare animal species in Ohio. The game laws of the State are applicable to Camp Ravenna, and enforceable by ODOW Game Protectors and other state law enforcement agencies. One of the ODOW goals is to provide wildlife based recreational opportunities to Ohio citizens. They also have many years of experience and expertise in administering wildlife management and public use programs.

The OHARNG is the lead agency for wildlife management at Camp Ravenna and determines overall program objectives, public access policies, and administers the wildlife management program on the training site. The ODOW provides wildlife management technical and administrative assistance and support to facilitate public access programs. Both agencies focus on common goals and work together to provide programs that are compatible with the military mission. Camp Ravenna and ODOW representatives meet at least once per year in the spring to discuss specific programs and activities and to determine deer hunt dates and other specific program needs for the coming year. The specific roles and responsibilities of each agency are listed below.

The OHARNG and the Camp Ravenna Environmental Office will:

- Develop wildlife management plans, programs and objectives that are consistent with the military missions, safety, and security requirements of Camp Ravenna.
- Develop hunting, fishing, trapping, and other wildlife related policies, procedures, and regulations.
- Provide a copy of wildlife management plans and hunting, fishing, and trapping regulations to ODOW.
- Allow ODOW personnel to have access to Camp Ravenna for law enforcement and wildlife management purposes described in this plan.
- Allow public access and determine public access policies, procedures and quotas that are compatible with military use of the installation.
- Allow ODOW to release deer and other rehabilitated or captured wildlife at Camp Ravenna in numbers compatible with the Camp Ravenna military mission and wildlife management program.
- Determine and provide necessary logistic support, not provided by ODOW, to facilitate safe and secure public access.

The ODOW will:

- Provide technical wildlife management assistance, recommendations, and evaluation of Camp Ravenna wildlife management programs.
- Provide Camp Ravenna with proposals and recommendations for improving existing wildlife management programs and implementing new programs.
- Approve deer hunt dates outside of the regular Ohio deer season for the controlled deer hunt at Camp Ravenna.
- Allow hunters to use special antlerless urban deer tags and to take a minimum of two deer during the Camp Ravenna controlled deer hunts.
- Administer public drawings and mail approved permits and information to successful applicants for the deer hunts and other public hunts and/or fishing and trapping.
- Provide Camp Ravenna with electronic data base rosters of successful public applicants at least two weeks prior to each public event.
- Provide personnel, material, and equipment necessary to conduct ODOW sponsored management activities at Camp Ravenna such as deer check station, population surveys, habitat projects, and wood duck nest box placement and monitoring.
- Provide Camp Ravenna annually with a roster of ODOW employees authorized to access the installation for purposes of this plan.
- Coordinate all Press Releases and other publicly released written material about Camp Ravenna with Camp Ravenna prior to its release.
- Enforce state hunting, fishing, and trapping laws at Camp Ravenna.

The USFWS is also a cooperator in wildlife management at Camp Ravenna. The focus of the USFWS involvement is in the area of federally listed endangered, threatened, and candidate species management. This effort does not require as much involvement as the cooperative programs with the ODOW. Both agencies meet with the OHARNG at an annual meeting to review INRMP implementation and discuss current year programs.

6.3.2 FISH MANAGEMENT

Fish management receives minimal attention at Camp Ravenna because there are no mission impacts if fish populations are not actively managed and available manpower within the Camp Ravenna Environmental Office is spent on other wildlife management programs and forestry. Public access programs for fishing have been tried in the past, but are difficult to implement due to the manpower needed to oversee and manage the public while on Camp Ravenna. Fishing is currently permitted for employees and their guests in most of the ponds at Camp Ravenna in accordance with Federal and state laws and regulations. The fishing program is summarized in **Section 6.13.** Fisheries management is a program area where more effort is possible but in-house manpower and expertise is limited and substantial effort by the ODOW is not justified because unescorted public access is unlikely.

Some of the ponds at Camp Ravenna were constructed and used as settling ponds for explosive contaminated outwash from the load lines. Some water and sediment sampling for contaminants of concern has been conducted in these ponds. Preliminary results show no contamination in the water. Some of the sediment tests had elevated concentrations of heavy metals and a few came back positive for a very low concentration of explosives. The ODOW collected fish and the OEPA tested the fish tissue for heavy metals. The fish tissue tests came back within normal range for heavy metals. The remediation process is ongoing for surface water, therefore conclusions as to final use restrictions can not be made at this time. Discussions were held with the Camp Ravenna Environmental staff and the OEPA, and it has been determined that catch and release fishing with no wading (shore fishing) can be permitted in these ponds.

Because there is no detailed population data on the Camp Ravenna ponds, and there is concern regarding decimation of the largemouth bass population, special take restrictions that are more stringent than the State creel limit are in place for largemouth bass. In ponds demonstrated to have a large population of stunted bass, the Camp Ravenna Environmental Office will allow the harvest of additional small bass up to the legal amount designated in State fishing regulations. State creel limits apply for bluegill and all other fish in ponds not undergoing environmental remediation. A fish-stocking program is not needed at this time. All non-game fish caught are returned to the water. Management techniques discussed in **Section 6.5** will be used to maintain fish habitat. Bait fish and crayfish will not be permitted on the installation for fishing due to the potential to introduce non-native species into aquatic environments.

6.3.3 WHITETAIL DEER MANAGEMENT

The white tailed deer population has the propensity to grow to a level destructive to their habitat and disruptive and dangerous to military training and Camp Ravenna operations. If not managed, the deer herd will quickly grow in size and outstrip their food source. This not only negatively impacts the deer herd, but all other species in the ecosystem. There are areas within Camp Ravenna that have been very heavily browsed by deer in the past. The browsing destroys the biological diversity that is essential for perpetuating healthy ecosystems and sustainable training lands. A high deer population also increases the risk and occurrence of deer-vehicle accidents both within the Camp Ravenna fence and outside of the fence.

The goal of the Camp Ravenna deer management program is to keep the herd at or near carrying capacity in a cost effective manner with no disruption or reduction in military training, no violations of security requirements, and as safely as possible.

To accomplish this goal, controlled public access will be permitted for the purpose of whitetail deer hunting. It is in the best interest of the communities and individuals living around Camp Ravenna, the OHARNG, and the ODOW to manage the deer herd in a manner that provides public recreation while minimizing mission conflicts. To facilitate public access, special out of season hunting dates are permitted by the ODOW. Available dates are determined by trainers and other Camp Ravenna users and no activity other than deer hunting is scheduled in areas being hunted. Hunting is also permitted for employees and their guests during regularly scheduled Ohio deer gun and bow seasons when access

is compatible with mission and other activities on site. Details on this program are given in Section 6.13.

6.3.3.1 POTENTIAL MISSION CONFLICTS

Potential mission conflicts include training, security, safety, and manpower concerns.

- **Training:** To effectively manage and control the deer herd, the entire Camp Ravenna must be hunted. Training takes presidence over hunting. Hunting dates are scheduled around the training schedule and/or hunting areas within proximity of active trainng areas are closed.
- **Security:** Due to military training and ongoing environmental restoration, access to Camp Ravenna is controlled. Only escorted or controlled access is permitted on the installation. Hunters and their vehicles on the installation are a security concern that requires extra work and compensatory measures to manage.
- **Safety:** The safety of employees, hunters and people who live around the perimeter of Camp Ravenna is of paramount concern. There have been two known shooting accidents during deer hunts. One was a minor flesh wound in 1996 and one resulted in the death of a hunter in the early 1980s. There have also been off-post buildings shot during deer hunts. Public safety around tracked vehicles and military training as well as in and around environmental AOCs must be considered and managed as part of the public access programs. Minimizing exposure is the best way to maintain and improve safety.
- **Manpower:** The deer hunt requires a large amount of manpower to administer. The ODOW solicits and processes thousands of applications and permits. They also provide at least one employee to help at the Camp Ravenna deer check in for eight hours each hunt. CRJMTC-ENV staff members put in 12 to 15 hours per hunt day. An additional 100 to 300 man-days are spent in hunt preparation and administration. The Camp Ravenna military staff also provides manpower for mowing, vehicle inspections, and patrolling Camp Ravenna during deer hunts. Approximately 110 volunteer escorts (VE) work 12-hour days for each deer hunt and spend several days prior to the hunts marking hunt area boundaries and making other preparations for the hunts. CRJMTC-ENV staff and volunteers also conduct the annual roadside deer survey.

6.3.3.2 MANAGEMENT PRACTICES

The deer herd will be managed by maintaining a buck to doe ratio close to one buck per every 2 does (1:2). The actual ratio will vary from year to year depending upon harvest numbers and recruitment. Doe numbers will be controlled by conducting “antlerless only” hunts. The number of “antlerless only” hunts will be manipulated each year to maintain stability in the size of the herd. An annual late summer road side census will be used to estimate the sex ratio and fawn to doe ratio each year. When available, a winter aerial population survey will be used to determine the total population. When not available, mathematical calculations coupled with general field observations will be used to estimate the total population. Program modifications will be made as necessary to properly manage the deer herd and keep the population within carrying capacity. The overall objective is to manage the deer herd growth by maintaining a lower number of reproductive females in the population than would normally be present in a hunted deer population. This will result in a lower annual recruitement of fawns, a lower pre-hunt population, and the need for fewer hunts to maintain the herd at carrying capacity.

This program is similar to quality deer management, with one exception: the main objective is not to grow large bucks. Supplemental mineral blocks and food plots will not be provided to increase deer nutrition and encourage antler growth. The deer herd will be managed within the limits of the natural habitat and the food available in the habitat. Under this doe management system, the age distribution and number of bucks will increase. This will result in more large bucks and should help to keep hunter interest strong.

6.3.3.3 CARRYING CAPACITY

Based on generally accepted methodology for habitats containing a high portion of young forests, thick brushy fields, and no agricultural crops, the winter carrying capacity of Camp Ravenna is 20 deer per square mile, or approximately 680 deer. A detailed study of the Camp Ravenna habitats and calculation of the actual carrying capacity has never been done. General observations of vegetation or deer browse surveys are used to help determine if the deer population is too high and negatively impacting the vegetation. A herd larger than 680 deer does not automatically result in habitat destruction. There are times when the herd has been larger than 680 deer with no noticeable impacts on the vegetation. In all likelihood, Camp Ravenna can probably support over 680 deer without long term negative impacts to the habitat. Until such a time as a detailed study can be done to determine the actual carrying capacity, the target winter carrying capacity will be 700 deer, with a maximum of 900 deer, unless negative impacts on the vegetation or animals are observed.

6.3.3.4 SIZE OF THE HERD

The deer herd size has been historically estimated each year using a winter aerial survey conducted by the ODOW and a late summer roadside survey conducted by Camp Ravenna personnel and volunteers. Both surveys provide an index to gage the size of the herd. The roadside survey also provides an idea of the buck to doe ratio and doe to fawn ratio. The aerial survey is generally thought to give a count that is 60 percent to 70 percent of the actual number of deer. The roadside count does not give a good estimate of actual numbers, but does give an index over time to show if relative deer numbers are up or down. Records on the aerial count and the roadside surveys are kept in the Camp Ravenna Environmental Office.

In 2003 the ODOW stopped conducting aerial deer counts. The population has been estimated recently based on the previous year's population minus the harvest plus estimated recruitment. The recruitment is calculated based on the sex ratio and fawn to doe ratio data gathered during the road side deer survey. It is preferable to have an aerial count at least biennially to verify mathematical calculations. Future surveys may be possible if funding is available, or if they can be worked into the training mission.

Managing the ratio of bucks to does in the herd is having the desired impact on the growth rate, which has decreased and appears to have stabilized. The deer herd is generally within the 600 to 800 deer carrying capacity. The buck to doe ratio has been as high as 1:7 or more in the past and is currently between 1:1 and 1:2 with the goal to keep it as close to one buck per every two does as possible. Management must be adaptive to account for impacts of disease outbreaks that can reduce the population or low harvest numbers that can cause an increase. As the actual population total and sex and age ratios vary and hunting pressure is adjusted to move them toward the desired sate.

6.3.3.5 POPULATION SURVEYS AND BIOLOGICAL DATA

In order to support the Camp Ravenna deer management program the following surveys are conducted and data gathered:

- **Aerial Survey** – Until 2003, ODOW conducted an aerial survey to count the deer each winter after the deer hunts are over. This count varies in accuracy depending upon conditions and deer movements, but is generally thought to produce a number that is approximately 60 percent to 70 percent of the actual size of the herd.
- **Road Survey** - Each August volunteers conduct a driving road side survey to count and tally deer by sex and age (adult or fawn) throughout the entire Camp Ravenna. This data is used to determine buck to doe ratios, doe to fawn ratios, and as an index to see how these ratios and total deer observations are changing over time.
- **Browse Survey** - Vegetation is observed while in the field to determine if a browse problem exists. Specific browse survey transect are established to develop quantitative data and monitor browse damage more closely if heavy browse is observed.

- **Deer Station Data** - Every deer that is harvested at Camp Ravenna is checked on the installation and the following data collected: sex, age, weight, number of antler points per side, and antler beam diameters. The hunting area the deer was taken from is also recorded.

6.3.4 SMALL GAME MANAGEMENT

Small game management primarily consists of maintaining diverse habitat and small scale hunting and trapping programs. Hunting programs include small game, waterfowl, and turkey. These programs are limited in scope and participation due to mission conflicts, the environmental restoration program and the associated access restrictions. Details of the programs are given in Section 6.13.

6.3.5 NUISANCE WILDLIFE AND WILDLIFE DISEASES

An animal can be considered a nuisance when it causes damage to government property, is a health or safety risk to humans or other animals, or is a disruption to normal ecosystem function. The primary nuisance animals at Camp Ravenna are feral cats, pigeons (*Columba livia*), starlings, raccoons, muskrats (*Ondatra zibethicus*), and beaver. With the exception of feral cats, these animals are not always considered a nuisance. Feral cats are not a normal part of the ecosystem and can decimate bird populations and carry diseases. Pigeons are a nuisance when they roost in buildings and defecate on equipment and vehicles. Starlings can also defecate on vehicles and equipment, and they can take over habitat and displace native bird species. The greatest concern with raccoons is their potential to transmit disease to humans. Muskrats burrow into earthen dikes and compromise their integrity as well as cause minor flooding problems by clogging culvert pipes. Beavers are a problematic when they flood roads, and railroad tracks, buildings, and training areas. While beaver activity can be destructive, it can also be very beneficial. For this reason beaver require special management attention and are discussed further in **Section 6.3.6**.

Coyotes are often considered to be a nuisance species by sheep farmers and sportsman. There is a healthy population of coyotes at Camp Ravenna, but they are not considered a nuisance. The coyote population has risen since the late 1980s and is now well established. Since the advent of the coyote population, the wild dog population has disappeared and the feral cat population has decreased dramatically. The groundhog population is down low enough that groundhogs are no longer a nuisance and a diseased raccoon is seldom seen. The opportunistic feeding habits of the coyote seem to make it one of the best control agents for many nuisance animals. Coyotes also take some white-tail fawns every year and scavenge field dressings left after the deer hunts. Coyotes have also been seen hunting in packs and taking down mature deer. To keep the coyote population healthy and in balance, deer hunters are allowed to harvest coyotes while deer hunting and coyote trapping is permitted.

Nuisance animals are primarily controlled through natural predation. Natural predation is augmented by trapping, hunting and other lethal and non-lethal methods as appropriate.

6.3.6 BEAVER MANAGEMENT

Because beaver activity can be both highly beneficial for the creation and maintenance of wetland habitat and potentially destructive to government property, special efforts must be taken to manage the population. Beaver will be managed through controlled trapping during the normal Ohio trapping season whenever possible. In emergency situations when beaver flooding is destroying government property out of trapping season, installation personnel will remove the beaver. The Camp Ravenna beaver management program is controlled by the Camp Ravenna Environmental Office. The destruction of nuisance beaver out of season has the concurrence of the ODOW. The goal of the beaver management program is to retain valuable beaver impoundments and eliminate those creating a hazard, damaging government property, or rendering training area unusable. The following beaver management procedure will be used.

- **Methodology:** Camp Ravenna will use selective beaver trapping in coordination with the Ohio trapping season to control beaver whenever possible. In the case of beaver damage outside the State beaver trapping season, the State Wildlife Officer assigned to Portage

County has authorized the nuisance beaver to be controlled as necessary. Beavers are considered a nuisance when they flood roads, buildings, or training areas. Nuisance control is done on a case-by-case basis when specifically authorized and supervised by the Camp Ravenna Environmental Office. Beaver taken out of season may not be removed from the installation.

- **Procedure:** Annually the ENV Office will designate which impoundments can and cannot be trapped, and will designate any special take restrictions necessary to perpetuate the beaver population/impoundments. The number of trappers needed will be determined based on control needs. The Camp Ravenna Hunting, Fishing, and Trapping Regulation 200-3 will be followed. The Camp Ravenna Environmental Office will brief the trappers on the Camp Ravenna trapping and safety regulations. Beaver trapping will be permitted only as designated in the briefing and Camp Ravenna Regulation 200-3. Trappers found trapping in non-designated areas or removing beaver in excess of the designated number will be banned from the installation and will lose their hunting, fishing and trapping privileges on the installation.
- **Beaver Trapping Restrictions:** A map with specific take restrictions will be developed annually for distribution to trappers.

BEAVER
(PHOTO TIM DANIEL ODNR)

6.4 MANAGEMENT OF THREATENED AND ENDANGERED SPECIES

This section presents information about the management of sensitive species that are located or may be located at Camp Ravenna, and requirements and strategies for management. There are no federally listed endangered, threatened, or candidate species, or critical habitat at Camp Ravenna. The northern long-eared bat is proposed for listing as an endangered species and is expected to be listed in mid-2015. It does exist at Camp Ravenna.

Laws and regulations pertaining to the management of threatened and endangered (T & E) species include the following, which are described in **Appendix E**.

- ESA of 1973 (16 USC 1536);
- SAIA (16 U.S.C.670a et seq.);
- AR 200-1, Environmental Protection and Enhancement;
- Migratory Bird Treaty Act of 1918;
- Authorization of Take Incidental to Military Readiness Activities (50 CFR 21.15);
- Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250);
- DoDI 4715.03, Natural Resources Conservation Program;
- ORC § 1531.25, Protection of species threatened with statewide extinction; and
- ORC § 1531, Endangered Species.

The following guidelines will be followed to facilitate the military mission and natural resources management objects while minimizing negative impacts on rare species and their habitats.

- Consult biological inventories and this plan in the planning stage of projects and forest management operations to ensure rare species and unique habitats are identified and special needs considered.
- Update biological inventories periodically as the occurrence of threatened and endangered species is subject to change over time as a result of either recruitment, identification of additional protected species, or the change in status of species currently present at Camp Ravenna.
- Consult and follow requirements and guidelines found in Appendix J of the INRMP.
- Tree felling and brush cutting of vegetation 3" in diameter and greater will not be conducted between 1 April and 30 September to avoid potential impacts to roosting bats.
- When practical, mowing and brush cutting (less than 3" diameter brush) will not be conducted between 15 April and 15 August to minimize disturbance on ground and shrub-nesting birds.
- Protect and maintain the blueberries throughout the installation, especially in the oak-maple swamp forest in the southeast corner of the installation in Portage County, as they are the only known food source for the state endangered moth the Graceful Underwing *(Catocala gracilis)*.

In cases where endangered species management and mission activites conflict, consultation with the USFWS and the ODNR (as appropriate) will be initiated to avoid impacting any listed species. The OHARNG is required to manage federally listed threatened and endangered species. Failure to protect federally listed species could lead to an ESA violation, which could negatively impact training land availability.

Management of state listed species is not as regulated as federally listed species. The Ohio Endangered Plant Law (ORC 1518.02) states that "No person shall willfully root up, injure, destroy, remove, or carry away on or from public highways, public property, or waters of the state, or on or from the property of another, without the written permission of the owner, lessee, or other person entitled to possession, any endangered or threatened plant." The state law prevents taking of state endangered plants without the landowner's permission. There is no prohibition to taking state listed plants on federal property. The Ohio Endangered Animal Law restricts "the taking or possession of native wildlife, or any eggs or offspring thereof, that he (Chief, Division of Wildlife) finds to be threatened with statewide extinction" (ORC 1531.25). The state law is applicable to all land within Ohio including federal land, but does not define take nor does it have any requirement for habitat protection nor any requirements for consultation. The law applies directly to taking of animals, eggs and/or young. Neither of the State laws requires special management action or consultation with the Ohio Department of Natural Resources. The OHARNG will protect state listed species whenever possible. This is best accomplished by the implementation of the INRMP and maintenance of a diverse and sustainable ecosystem.

6.4.1 FEDERALLY LISTED SPECIES IN PORTAGE AND TRUMBULL COUNTIES

There are no known federally listed species at the RLTS at this time. The northern long-eared bat (*Myotis septentrionalis*) is proposed for listing as an endangered species and is expected to be listed in October 2014. It does exist at Camp Ravenna and this INRMP has been updated to manage it as if it is already listed. The bald eagle was listed by the United States Fish and Wildlife Agency (USFWS) as a federally threatened species protected by the Endangered Species Act (ESA) of 1973 until 8 August 2007, when it was formally delisted. However, bald eagles remain protected by the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). The bald eagle is no longer listed by the ODOW as a state rare species.

Federally listed species with known occurrences in Portage and Trumbull Counties, Ohio include the threatened northern monkshood *(Aconitum noveboracense*), the endangered Mitchell's satyr butterfly *(Neonympha mitchellii mitchellii*), the endangered clubshell *(Pleurobema clava*), the endangered Indiana bat, the proposed endangered northern long-eared bat, and the candidate eastern massasauga (*Sistrurus catenatus catenatus*). General information and management guidance for each species is listed below.

6.4.1.1 BALD EAGLE

In 2010, a pair of bald eagles was found nesting in forest management unit 3 on the south central side of the installation. Before this time, it was only identified as an occasional migrant to Camp Ravenna where it has been, periodically seen flying overhead or pearched on a tree.

BALD EAGLE (PHOTO ODNR)

The bald eagle is one of the largest birds of prey in the world, with a 6 1/2- to 8-foot wing span. The bird can be 3 to 3 1/2-feet long, and weigh 8 to 15 pounds. The distinctive white head and tail mark an adult (a sexually mature individual that is at least four to five years old). Younger individuals vary from solid dark brown to a generally mottled brown and white plumage. Fish compose 60 to 90 percent of the bird's diet. Dead or crippled wildlife often are selected on the wintering ground. Nests are usually built in the top of a large tree. Many take up residence wherever they encounter open water and plentiful food. In Ohio, bald eagle nest mostly in the marsh region of western Lake Erie, however, nesting occurs in northeast Ohio along the Sandusky River and in north-central Ohio. Nonbreeding birds can be found anywhere in the state at anytime of the year (ODOW, no pub.).

Camp Ravenna has developed management guidance and activity restrictions within the vicinity of the bald eagle nest based on the May 2007 USFWS National Bald Eagle Management Guidelines and the tolerance level of the bald eagles. If a project or training activity must be conducted within a designated buffer zone, the USFWS and/or the Ohio DNR will be consulted. Bald eagle nest restrictions are published annually in the Camp Ravenna Training Area Use Limitations Memo signed by the Garrison Commander. This memo is distributed to all units who train at Camp Ravenna. The bald eagle management guidance is provided in **Appendix J**.

6.4.1.2 NORTHERN MONKSHOOD

NORTHERN MONKSHOOD (PHOTO ROBERT SHALLENBERGER, USFWS)

The northern monkshood is noted for its very distinctive, blue hood shaped flowers. Flowers bloom between June and September. This plant species is typically found on shaded or partially shaded cliffs, slopes or cool streamsides. The northern monkshood is threatened as a result of habitat loss and degradation caused by the filling of sinkholes, human foot traffic, logging, and road building.

The site does not contain shaded cliff faces in wooded ravines, or other suitable habitat for the northern monkshood, therefore no impacts to this species are anticipated (USFWS, 2005).

6.4.1.3 MITCHELL'S SATYR BUTTERFLY

Mitchell's satyr butterfly is small and fragile with translucent wings that have yellow rimmed black eyespots on the underside. The favored habitat for this species is sedge-dominated fens with low shrubs and tamaracks. This butterfly has declined in most of its range and has disappeared from its former habitat in northeastern Ohio. Management of this species includes the prevention of drainage, conversion or trampling of its wetland habitat.

The Mitchell's satyr butterfly has not been observed at Camp Ravenna to date. Lepidoptera inventories are on a five-year cycle. The most recent survey was conducted during the 2005 field season.

MITCHELL'S SATYR
(PHOTO JOHN SHUEY, USFWS)

6.4.1.4 INDIANA BAT

The federal and state endangered Indiana bat (*Myotis sodalis*) is a medium-sized bat with dull grayish chestnut fur. This bat's diet consists of insects, especially soft-bodied moths, beetles, flies, and caddis flies that are trapped under closed tree canopies over small streams. Females and juveniles feed within the airspace of riparian and floodplain trees, while males feed in the densely wooded area near the top of the trees. Migration to the wintering caves usually begins in August. Indiana bat habitat consists of caves, mines, small stream corridors with well-developed riparian woods, and upland forests and bottomland forests. Peak breeding activity is in September and October, and mating takes place at night on the ceilings of large rooms near cave entrances. The gestation period lasts between 49 and 56 days. Pups are born normally in June or July in a litter size of one. Hibernating colonies disperse in late March south of Ohio (the majority going to Kentucky), however some may reside in large caves in southern Ohio. In the summer, Indiana bats can be found in the western and northern portions of Ohio in site-specific locations for roosting but most of the bats migrate to more northern habitat for the summer (ODOW, 2003a). The decline of Indiana bat populations is a result of several factors that include the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, the loss and degradation of forested habitat, particularly stands of large, mature trees, forest habitat fragmentation, and most recently the White Nose Syndrome epidemic. Summer habitat is described as: dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas; live trees (such as shagbark hickory and oaks) with exfoliating bark; stream corridors, riparian areas, and upland woodlots that provide forage sites (USFWS, 2005).

INDIANA BAT
(PHOTOB USFWS)

Several Indiana bat surveys have been conducted at Camp Ravenna (Tawse, 1999; Davey Resource Group, 2002; Duffey & Brack, 2005, Tragus, 2010).

Survey efforts have provided no evidence of Indiana bats and the USFWS has concurred that sampling for individual projects is not an effective sampling method at this time at Camp Ravenna. The OHARNG will conduct an installation wide Indiana bat survey every five years. The surveys will be coordinated with the USFWS to ensure Camp Ravenna is adequately sampled. The need for individual surveys and/or brood tree netting surveys will be determined in consultation with the USFWS based on the site-wide survey results.

Surveys should be designed and conducted in coordination with the USFWS Endangered Species Coordinator (USFWS, 2005).

6.4.1.5 CLUBSHELL MUSSEL

The clubshell mussel prefers clean, loose sand and gravel in medium to small rivers and streams. This mussel will bury itself in the bottom substrate to depths of up to four inches. Reproduction requires a stable, undisturbed habitat and a sufficient population of fish hosts to complete the mussel's larval development. The mussel is endangered primarily due to pollution from agricultural run-off and industrial wastes, and extensive impoundments for navigation (USFWS, 1997).

Because of Camp Ravenna's location, the presence of clubshell mussel is not likely; no impacts to this species are anticipated (USFWS, 2005).

6.4.1.6 EASTERN MASSASAUGA

The eastern massasauga, one of two rattlesnakes native to Ohio, is a federal candidate species and a state endangered species. This species is also known as swamp rattler and black snapper. It is one of three venomous snakes in Ohio. The venom of the massasauga is hemolytic, meaning it breaks down the red blood cells of the bitten animal.

EASTERN MASSASAUGA
(PHOTOB USFWS)

The massasauga is a medium-sized (20 to 36 inches in length), dark-colored, pygmy rattlesnake with 29 to 50 dark dorsal blotches on its gray or brownish gray body. There are three rows of smaller dark spots on each side of the body. The head of this snake is thick and triangular, with black stripes and elliptical eyes. Its belly is black and irregularly marked with white or yellowish spots. Its most distinct feature is the small rattle on the end of its tail. The massasauga breeds in April and May, and young are born in late July through September. A litter ranges from three to 19 (average eight young), and are on their own after birth. This rattlesnake is active from mid-April to late October, and is most active from early May through mid-September.

In Ohio they are found in or near wet areas, including wetlands, wet prairie, or nearby woodland or shrub edge habitat. This often includes dry goldenrod meadows with a mosaic of early successional woody species, such as dogwood (*Cornus* spp.) or multiflora rose (*Rosa multiflora*). They prefer marsh and fen wetlands, and avoid open water. They prefer the cover of broad-leafed plants, emergents, and sedges. However, throughout their range in Ohio their numbers have reduced because of habitat alteration, particularly through farming. The massasauga is not a forested dwelling species; in fact natural succession of woody vegetation is a leading cause of habitat alteration (ODOW, 2003b).

The eastern massasauga has not been observed at Camp Ravenna to date. Herptile inventories are on a five-year cycle. The most recent survey was conducted in 2010.

Impacts to massasauga can be avoided by conducting clearing and construction activities in potential habitat in the summer when the air and ground temperature is greater than 65°F, and by performing maintenance activities (mowing, cutting, or burning) in massasauga habitat areas during the winter (November 1 to March 15) when snakes are hibernating. Johnson et al.'s (2000) *The Eastern Massasauga Rattlesnake: A Handbook for Land Managers* provides information for ground maintenance managers.

6.4.1.7 NORTHERN LONG-EARED BAT

The Northern long-eared bat (*Myotis septentrionalis*) is a medium-sized member of the genus *Myotis* whose range includes the eastern United States and Canada. They are medium to dark brown and their diagnostic ear length and pointed ear tragus distinguishes them from other local members of the *Myotis*

species. The Northern Long-eared bat is a cave dwelling species, it hibernates in the winter and migrates to forested areas in the summer to forage and rear young. Hibernation generally occurs between September and May. The federally recognized Northern Long-eared Bat summer roosting season is April 1st to September 30th.

Summer roosting habitat for the Northern Long-eared bat differs for males and females. Males and non-reproductive females roost singly in trees as small as 3 inches diameter that have exfoliating bark, cracks, or crevices. Tree species is not particular for the Northern Long-eared Bat, rather they prefer trees on the interior of large upland forest tracks. Reproductive females will choose trees with similar characteristics, but choose larger trees with greater solar exposure where they form small maternity colonies and rear a single pup each year. Pups are born from around late May to early July, depending on the conditions of the year, and become volant (fly) within 3 to 6 weeks of birth.

Summer foraging habitat for the Northern Long-eared Bat is mainly confined to the interior of the forest where they use echolocation, and unlike other bats of the region, are able to maneuver in a denser understory. They are insectivorous and feed by both hawking (catching prey in flight) and gleaning (picking insects from leaves and branches), which is a unique behavior to this *Myotis*. Their main diet consists of moths, flies, beetles, and arachnids.

The USFWS proposed listing of the Northern Long-eared Bat in October of 2013 because of the major decline in the rangewide population due to White Nose Syndrome disease. The species is expected to be federally listed and protected by the Endangered Species Act within 2015.

There is no winter habitat (hibernacula) within five (5) miles of Camp Ravenna. There is both summer roosting and foraging habitat on and surrounding Camp Ravenna. Northern Long-eared Bats have been captured in bat surveys at Camp Ravenna; including 5 captures in 1998, 1 capture in 2002, 20 captures in 2004, and 29 captures in 2010. Captures included both male and female bats, adult and juvenile, pregnant and non-reproductive, indicataing that Camp Ravenna is providing summer roosting, maternity roosting, and foraging habitat for the species. Seasonal tree clearing in the summer roosting season (April 1st to September 30th) should be observed to assure no Northern Long-eared Bats are taken or injured.

In coordination with the USFWS Camp Ravenna has evaluated mission, facility maintenance and natural resources management activitiy potential impacts to the northern long-eared bat and developed management guidelines. Most acvtivities at Camp Ravenna do not adversely impact the northern long-eared bat. The primary restriction is that vegetation/trees greater than three (3) inches in diameter may not be cut during bat brood season, 1 April to 30 September. If a project or training activity outside of the routine activities already evaluated is conducted, the USFWS will be consulted in accordance with the ESA. Northern long-eared bat restrictions are published annually in the Camp Ravenna Training Area Use Limitations Memo signed by the Garrison Commander and distributed to all units who train at Camp Ravenna. Northern long-eared bat management guidance is provided in **Appendix J**.

6.4.2 OHIO STATE-LISTED SPECIES

Several state-listed species are known to occur at Camp Ravenna (see **Table 14**). General management recommendations in order to protect and conserve them include:

- Prevent further colonization of non-native species;
- Protect and conserve, when feasible, the diverse habitats at Camp Ravenna, in particular the Special Interest Areas discussed in **Section 4.4.3**;
- Avoid activities that might result in habitat fragmentation or reduce habitat heterogeneity (for example, stream impoundment and removal of dead fall in forests); and
- Maintain stream crossings to protect water quality.

6.5 WATER RESOURCE MANAGEMENT AND SOIL CONSERVATION

A watershed inventory of Camp Ravenna was conducted by the USGS to provide the necessary background information for proper water resources management at Camp Ravenna (Ostheimer & Tertuliani, 2002). The purpose of this study was to provide an inventory on current watershed conditions and present management guidelines to help the OHARNG fulfill its training needs while maintaining compliance with Federal, State, and local laws and regulations governing water resources. The USGS study also compiled and summarized previous studies conducted for the OHARNG at Camp Ravenna.

In general, every effort is made to prevent water quality degradation by minimizing and mitigating activities with the potential to degrade water quality. Land use is matched with the capability of the land to support the use. Activities are limited within the vicinity of wetlands and headwater areas. BMPs are used in all ground disturbing activities. Vegetated riparian buffers are maintained. Dredging, and channel modification is not done. Bridges and culverts are used at stream crossings and sedimentation of streams is not tolerated. Laws and regulations pertaining to water resource management include the following, which are described in **Appendix E**.

- Federal Water Pollution Control Act as amended by the CWA of 1977 (33 USC §1251);
- U.S. Fish and Wildlife Coordination Act (16 USC §661);
- NEPA (42 USC §4321);
- EO 11990, Protection of Wetlands;
- EO 11752, Prevention, Control, and Abatement of Environmental Pollution;
- EO 12088, Federal Compliance with Pollution;
- Soil Conservation Act (16 USC §590a et seq.);
- Federal Water Pollution Control Act as amended by the CWA of 1977 (33 USC §1251);
- EO 11989, Off-road vehicle use;
- SAIA (16 USC §670 *et seq.*);
- AR 200-1, 32 CFR 65; and
- OAC §3745-1, Ohio Water Quality Standards.

6.5.1 MANAGEMENT OF WATER QUALITY AND HEADWATER AREAS

Surface water quality has not historically been a concern at Camp Ravenna because only a small portion of Camp Ravenna is paved and minimal off-road training activities have occurred. However, maintaining headwaters and water quality will be a focus in future years as the development of training lands and training activities increase.

Headwater areas are those drainage areas, water seeps, and springs that may or may not be identified on USGS 7.5-minute topography maps, but are present in the field and are the upper reaches of a drainage area. The drainage ways are usually dry for part of the year and usually are mapped on the NRCS County Soils Inventory Maps. Water seeps and springs are usually wet year round. Headwaters may or may not be included within designated riparian zones.

The OHARNG will operate in such a manner as to fulfill mission requirements while protecting headwater areas to the greatest extent possible. Occasional crossing of dry drainage ways may be done without bridges or culverts with minimal impacts to the drainage way. Regular crossing requires the designation of crossing sites and the installation of temporary bridging or culverts. Water seeps and springs and adjacent saturated areas are unable to support troop activities and vehicle traffic. A buffer zone will be established around these areas and no ground disturbing activity permitted. As

necessary, such sites will be identified in the field by the Camp Ravenna Environmental and the training unit Commander. Staff will be briefed on their locations and operational limitations as applicable.

Requirements for conducting forest management operations within headwaters areas are given in **Section 6.8.9.2**.

If resources become available for aquatic resource management, the USGS watershed inventory report also recommended establishing a sampling program. The sampling program would be designed to detect contaminants associated with training activities and minimize the cost and frequency of samples. The baseline water quality over a suggested three year period would first need to be established. Additionally, the USGS recommends installing gaging stations with automatic sediment samplers, in particular at Hinkley Creek and South Fork Eagle Creek. In order to fund such sampling there must be a legal requirement such as a permit.

6.5.1.1 LOW-WATER STREAM CROSSINGS

A low-water stream crossing (LWSC) is a structure that provides access across a stream during normal flow but is periodically closed due to flooding. LWSC can provide low cost alternatives to bridges or culverts for areas with low traffic volumes like training roadways at Camp Ravenna. They are particularly suitable across streams that are sometimes dry or with low normal depth of flow. Usually, LWSCs are designed to provide streambed stabilization as well as access. (Center for Transportation Research and Education [CTRE], 2001). Low-water crossings should not raise the substrate elevation above existing conditions in order to avoid ponding above the crossing, which may cause sediment deposition. Three common types of LWSC are:

- **Unvented Ford** - This structure has no culvert pipes and crosses streams that are dry most of the year, or have normal depth less than six inches. An unvented ford can conform to the streambed or it can be raised above the streambed. These crossings are usually constructed of rip rap, precast concrete, crushed stone, or articulated concrete. These are most suited for intermittent or ephemeral streams, or wide and shallow perennial streams.
- **Vented Ford** - This type of LWSC has one or more pipes under the crossing to accommodate low flows without overtopping the road. Water will flow over the crossing during higher water events. The pipes or culverts can be embedded in Portland cement concrete, aggregate, rip rap, or earths fill. A vented ford may work where stream depth is deeper than recommended for an unvented ford. However, if there is a high potential for debris that may clog the pipes, this type of crossing is not recommended.
- **Low Water Bridge** - This is a flat-slab bridge deck that is approximately the elevation of the stream bank. Its smooth cross section allows high water to flow over the structure without damaging it. This type of LWSC is recommended where higher streamflows exceed the capacity of a vented ford, where there is potential for clogging, or where an obstruction in the streambed would not be environmentally acceptable (CTRE, 2001).

6.5.2 RIPARIAN ZONE MANAGEMENT

For purposes of this management plan riparian areas will be defined around blue line streams on 7.5 minute USGS topography maps, surface waters, isolated wetlands, and jurisdictional wetlands. Riparian zones are lands adjacent to these streams, rivers, lakes, and wetlands. They can be highly productive ecosystems because they receive nutrients, water, and energy from the adjacent uplands. They are important features of the training site because they intercept overland drainage, reduce stream bank erosion, help trap sediments and nutrients, filter water and replenish groundwater reserves, and help to moderate flooding. Riparian zones are also important habitats for wildlife because the riparian vegetation is often unique and very diverse, and creates travel corridors for wildlife.

When doctrinally required military training necessitates vehicular stream crossings, the OHARNG will coordinate planning with the USACE Pittsburgh Office and obtain required CWA permits. Permanent stream crossing sites will be established and vehicular traffic limited to using these crossing sites.

Drainage ways, creeks and streams will be crossed at right angles using culverts and/or bridging. BMPs will be utilized in construction of the stream crossings to minimize restriction to surface water flow and mitigate the storage capacity of the floodplain.

Regular vehicular traffic is not permitted within riparian zones. In general, buffer zones around riparian areas and around all appropriate streams include:

- 50 feet for 0 percent slope;
- 95 feet for up to 10 percent slope; and

130 feet for up to 20 percent slope.

Vehicles are not permitted within established buffer zones without prior review and approval of the Camp Ravenna TSC and Environmental Office.

The OHARNG will also:

- Maintain riparian zones to reduce build-up of sediments;
- Conduct only limited timber harvesting in riparian zones (see **Section 6.8.9.1**);
- Identify and protect wildlife habitats and other vital ecologically sensitive areas from disruption;
- Ensure tracked vehicles minimize inadvertent damage to floodplains, wetlands, and watercourses and mitigate any damage as soon as possible; and
- Present all construction project plans to the Camp Ravenna Environmental Office for review as far in advance as possible in order to identify and obtain any special permits that may be required.

6.5.3 EROSION AND SOIL CONSERVATION

Erosion control and soil conservation are important water resource conservation issues. Accelerated erosion, continued compaction, or the removal of topsoil can drastically alter soils. Sediment resulting from erosion affects surface water quality and aquatic organisms. Two main types of soil erosion exist, wind erosion and water erosion. Wind erosion is generally not an issue at Camp Ravenna because of the type of soils, a lack of steep slopes, and a dense vegetative cover.

Water erosion is the primary concern at Camp Ravenna within areas made bare due to training, construction, and other activities. Accepted BMPs are utilized during activities that could potentially disturb soils or impact water resources. In addition, off road training activities are matched to soil suitability and seasonal limitations as much as possible to avoid and minimize soil disturbance and the need for rehabilitation. Construction, engineer equipment training, and tracked vehicle training are the most disruptive activities to soil at Camp Ravenna.

The seasonal distribution of rainfall and soil type directly influences how severely a soil will be disturbed and the ability of the soil to recover from disturbances caused by certain types of mechanized training and other off-road vehicle activities. For example, soil disturbance is usually less when the ground is dry or frozen. Soil stabilization occurs over a shorter period of time when the average temperatures are above freezing and rainfall is frequent. Therefore, certain types of mechanized training and other off road activities are better suited for scheduling during the warmer months and dry soil conditions or the winter months and frozen soil conditions. Scheduling for ideal soil conditions and locating in ideal soil types is not always possible, but it is a consideration in planning and operations.

Under the reauthorization of the Clean Water Act, all construction activity that creates one acre or more of bare soil must be permitted under the OEPA General NPDES Permit for Storm Water Discharge Associated with Construction Activities. Camp Ravenna operates all ground disturbing activity under the conditions of this permit. Coverage under the permit is obtained by submitting a Notice of Intent

(NOI) for coverage and a fee to the OEPA. The NPDES permit stipulates what erosion control and vegetation establishment standards must be met. Failure to comply could result in a $10,000 a day fine until deficiencies are corrected. Generally, the permit states that permanent stabilization must occur within seven days of final grading or when there is no construction activity for 21 days. Other erosion control measures such as water bars, hay bales, sedimentation ponds, and siltation fencing are stipulated in the permit along with the requirement to maintain installed erosion control structures and to keep a weekly inspection and maintenance log.

Incidental military training that disturbs the ground does not require an NPDES permit. There are no NPDES permits for such activities. Any construction activity required to prepare a site for training that disturbs more than one acre does require a permit and the Camp Ravenna dig site that is continually bare earth requires an individual NPDES permit. Sites that are used for off-road or other ground disturbing training activity are prepared prior to use with storm water management controls, such as silt fences, sedimentation ponds and vegetative buffers, to protect wetlands and prevent soil and other pollutant discharges from leaving the site. The local Soil and Water Conservation District is consulted on major projects. Vegetation is restored on disturbed areas in tactical vehicle maneuver areas between training events. In engineer equipment training areas that require continuous bare earth, permanent sedimentation ponds and diversion dikes are constructed and vegetative buffers are maintained. Vegetation is established on engineer equipment training sites only if they are being rested and where necessary to stabilizes specific areas within the training area. Dust control is done as needed using water or a soil palliative.

The timber harvesting operations at Camp Ravenna cause negligible soil erosion due to the flat topography and selective cutting practices, but the potential for erosion does exist at log landings, skid trails, and stream crossings. The state of Ohio, in conjunction with the Ohio Society of American Foresters (OSAF) and the Ohio Forestry Association, Inc. (OFA) have developed a booklet describing BMPs to minimize soil erosion caused by logging operations. These BMPs will be followed in Camp Ravenna harvest operations. They consist of practices such as bridging or culverting stream crossing, establishing grasses on exposed skid/logging roads and landings, installing water bars on roads, using hay bales as temporary sediment traps, and harvesting at times when there will be the least impact to the soil. The logger will be required to comply with and implement these practices.

Camp Ravenna will implement the following soil and erosion control management strategies:

- Minimize off-road vehicle traffic during wet soil conditions and as much as possible match training and off road activity to soil capability and seasonal limitations;
- Minimize soil disturbance and revegetate bare ground as soon as possible;
- Plant trees and shrubs, when appropriate, to stabilize soils and serve as wind breaks;
- Minimize the use of “bare ground” herbicides;
- Minimize the amount of impervious surfaces in newly developed areas;
- Minimize troop movements in ponds, wetlands, streams, drainage ways, headwaters and unapproved offroad areas;
- Install storm water management and erosion control measures prior to disturbing the ground and maintain them in accordance with the NPDES permit requirements.
- Adhere to BMPs for construction activities described in The Ohio State University College of Food Agricultural and Environmental Science’s Bulletin 818, *Best Management Practices for Preventing Contamination of Ohio's Ground and Surface Waters* and in USEPA’s *Storm Water Management for Construction Activities*; and
- Adhere to Ohio Logging BMPs.

6.5.3.1 RE-VEGETATION

Areas that are disturbed and made bare by training, construction, or other activity are required to be revegetated with grasses or other appropriate vegetation, such as trees and shrubs. Areas that need to be kept vegetation free for mission purposes must have appropriate storm water control measures in place to prevent soil erosion form moving off site. Seeding is done to effectively establish vegetation to prevent erosion in areas of purposeful or inadvertent disturbance to the soil. The established vegetation also provides cover and food for wildlife. Seed germination, seedling establishment, plant growth and plant reproduction depends upon a variety of soil and climatic factors. Selection of appropriate seed and planting stock material and proper sowing and/or planting are critical to successful vegetation establishment. Revegetation of any disturbed area depends upon the chemical and physical properties of the material in which the plants will be rooted. Only native plant species may be used at Camp Ravenna, unless specifically reviewed and approved by the Camp Ravenna Environmental Office. All areas seeded with grass must be mulched with a minimum of three square bales of straw per 1000 square feet of seeded area. Mulch netting is used instead of straw on slopes over 6 percent. Information on soil amendments and approved seed mixes and use designations are listed below. When native grass seed is used lime and fertilizer are not required unless the top soil is thin or absent.

Soil Formations – Correct pH and phosphorus levels and the need for nitrogen fertilization are necessary for keeping adequate vegetative cover on lands used for military training. Therefore, soil amendments (lime and fertilizer) should be applied to rehabilitation sites before seeding. Proper application procedures should include soil analysis to ensure proper nutrient application levels. Other factors to consider are soil moisture, effects of the amendment on non-target species, weather patterns and potential contamination of streams, ponds and lakes.

Lime is used to neutralize acidic soils. The rate of lime application should be sufficient to raise soil pH to a value to support the species of plant material used for revegetation. Quality agricultural limestone is generally the preferred choice. Lime should be incorporated into the top six inches of soil, which allows better rooting of plants, and minimizes lime loss via rainfall runoff. Lime should not be applied under wet soil conditions because it is difficult to incorporate uniformly into the soil.

Fertilizers consist of three primary plant nutrients: nitrogen (N), available phosphorous (P_2O_5) and water-soluble potash (K_2O). Mixtures of fertilizer materials are commercially available; their grade or content is expressed as a ratio in weight percent as N:P:K. Fertilizer should be applied according to the results of the soil test. Fertilizers are also incorporated into the top 2 to 4 inches of soil, and should not be applied when soils are wet. In wet soils, salt from the fertilizer forms, which can significantly reduce the percentage of seed germination, especially with grasses. The effectiveness of bacteria inoculated on legumes is also reduced under such conditions.

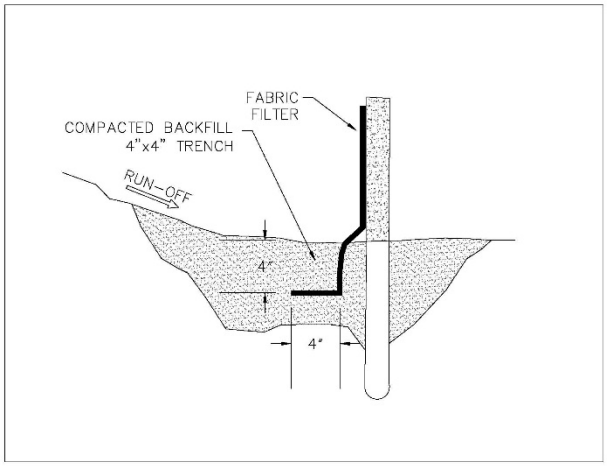
Approved Seed Mixes – The type and quantity of seed mixes depends on the application. Guidance for Camp Ravenna is provided in **Table 15**. Every effort will be made to use native seed mixes. Other seed mixes may be approved by the Camp Ravenna ENV on a case by case basis.

TABLE 15: REVEGETATION GUIDANCE			
NEED		**SPECIES AND PROPORTION**	**APPLICATION**
Temporary Cover for Ongoing Projects	Areas left idle for greater than 21 days, but scheduled for disturbance within the same growing season	100% Annual Ryegrass *(Lolium multiflorum)*	Broadcast at 30 pounds per acre. Drill at 20 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.
	Areas that will remain unfinished indefinitely	40% Nodding Wild Rye (*Elymus Canadensis*) 40% Virginia wild rye (*Elymus virginicus*) 15% Partridge Pea (*Chamaecrista fasciculate*) 5% Black-eyed Susan (*Rudbeckia hirta*) Add 10 lbs/ac Annual Ryegrass *(Lolium multiflorum)*/acre	Broadcast at 35 pounds per acre. Drill at 25 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.
	Late Season (after 15 September) quick, temporary cover	23.5% Nodding Wild Rye (*Elymus Canadensis*) 25% Virginia wild rye (*Elymus virginicus*) 18.75% Partridge Pea (*Chamaecrista fasciculate*) 1.5% Black-eyed Susan (*Rudbeckia hirta*) 31.25% Little Bluestem (*Schizachyrium scoparium*) Add 10 lbs/ac Annual Ryegrass *(Lolium multiflorum)*/acre	Broadcast at 25 pounds per acre. Drill at 18 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.
Permanent Cover for Site Closure	Open Areas	23.5% Nodding Wild Rye (*Elymus Canadensis*) 25% Virginia wild rye (*Elymus virginicus*) 22% Little Bluestem (*Schizachyrium scoparium*) 18.75% Partridge Pea (*Chamaecrista fasciculate*) 7.75% Thin-leaved Coneflower (*Rudbeckia triloba*) 1.5% Brown fox sedge (*Carex vulpinoidea*) 1.5% Black-eyed Susan (*Rudbeckia hirta*) Add 10 lbs/ac Annual Ryegrass *(Lolium multiflorum)*/acre	Broadcast at 18 pounds per acre. Drill at 12 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.
	Shaded, Partial Sun, Openings In Woods	31% Deertongue (*Panicum clandestinum*) 25% Virginia wild rye (*Elymus virginicus*) 25% Nodding Wild Rye (*Elymus Canadensis*) 10% Big Bluestem (*Andropogon gerardii*) 9% Side-Oats Grama (*Bouteloua curtipendula*) Add 10 lbs/ac Annual Ryegrass *(Lolium multiflorum)*/acre	Broadcast at 30 pounds per acre. Drill at 20 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.

6.5.3.2 SILT FENCES

In addition to seeding and mulching areas greater than 15 m^2, silt fence will be used to prevent silt from leaving the site. Line drainage points where runoff could occur with silt fences. Install silt fences according to the instructions below.

- Place the silt fence at the lowest elevation of the graded area.
- Fasten silt fence securely to each steel support post or to woven wire, which is in turn attached to the steel fence posts.
- Embed silt fence in trench and backfill.
- At each end of the silt fence, turn fence upslope, and extend until ground surface rises.
- Inspect the silt fence frequently, and repair or replace promptly as needed.
- Remove accumulated silt when it reaches a depth of 6 inches. Dispose of sediment trapped by this practice in an area not prone to erosion.
- Remove silt fence when it has served its usefulness to avoid blocking storm flow or drainage.



6.5.3.3 GUIDANCE FOR ROADWAYS AND DITCHES

Provide V-shaped side ditches as shown in DA, Field Manual (FM) 5-35 (1987). Size and shape the ditches according to this manual, generally with a 2:1 slope. Slopes should not be too steep to avoid bank sloughing. Provide properly sized and installed culverts according to FM 5-35 to protect roadways and prevent erosion. In erosive areas, use rip rap to stabilize the ditches. On steep erosive slopes, construct V-ditches with geotextile fabric and rip rap to add stability. If capable of properly constructing them, flat bottom ditches may be constructed in areas where V-shaped ditches tend to be cut and gully.

Shape and crown roads to drain water. Install culverts to improve drainage and minimize shrinking, swelling, and frost damage. Add crushed rock or gravel to prevent road damage caused by low strength.

Use straw bales in sloping areas where road ditches have a tendency to wash:

- Place straw bales end-to-end, perpendicular to the ditch to completely dam the waterway approximately every 50 feet. The anchored straw bales will slow the flow of water and prevent erosion.
- Place bales in a row with ends tight against adjacent bales.
- Embed each bale in the soil a minimum of 4 inches where possible.
- Anchor bales securely with wooden stakes or steel re-bar driven through the bales. Angle the first stake in each bale toward previously laid bale to force bales together.
- At each end of dike, turn dike upslope, and extend until ground surface rises 18 inches.
- Seed ditch banks with the recommended grass mixture. After the grass becomes established, remove every other row. Remove additional bales as the grass grows in where the removed bales were.

- Inspect bales frequently, and repair or replace them promptly as needed.
- Inspect and eliminate gullies that form under the straw bales.
- Remove accumulated silt when it is 6 inches deep to avoid impeding or blocking storm flow or drainage. If the silt is not removed, storm water may cut a new gully around the dike.
- Remove bales when they have served their usefulness. Fill in and smooth the area.

6.6 WETLAND AND FLOODPLAIN MANAGEMENT

Numerous wetland surveys, including both PLS and jurisdictional surveys, have been conducted at Camp Ravenna. A wetland PLS, which summarizes all available wetland mapping to date for Camp Ravenna, is available in the Camp Ravenna ENV office. Refer to **Figure 7** for composite wetland map. Delineating and mapping wetlands is a costly endeavor and jurisdictional and isolated wetland delineations are only valid for a five year period. The wetland PLS and composite wetland map are only useful as a very general, macro-level planning tool. Individual wetland delineation surveys are needed when planning ground disturbing activities.

One-hundred-year floodplain areas are shown on **Figure 6**, and are associated with Hinkley Creek and its tributaries, lower portions of Sand Creek and its tributaries, and South Fork Eagle Creek and its tributaries (including Sand Creek). An area of approximately 185 acres near the confluence of Sand Creek and South Fork Eagle Creek also is considered to be within the 100-year floodplain. Additional 100-year floodplain areas exist along the southern boundary of Camp Ravenna within unnamed Mahoning River tributary drainages (FEMA, 1987; U.S. Department of Housing and Urban Development [USDHUD], 1978).

Laws, regulations, and executive orders pertaining to wetlands and floodplain protection and policies include the following, which are described in **Appendix E**.

- Rivers and Harbors Act of 1899;
- Fish and Wildlife Coordination Act of 1967;
- Land and Water Conservation Fund Act of 1968;
- Federal Water Pollution Control Act as amended by the CWA of 1977 (33 USC §1251);
- EO11988, Floodplain Management;
- EO 11990, Protection of Wetlands;
- NEPA (42 USC §4321);
- SAIA (16 USC §670 *et seq*.)
- OAC §3745-1, Ohio Water Quality Standards
- ORC 6111.021 - .029, Isolated Wetland Rules

The following guidelines will be implemented to maintain compliance:

- While ensuring the successful conduct of doctrinally required military training, Camp Ravenna will minimize the destruction, loss or degradation of wetlands. In accordance with good stewardship practices, DoD and Army policy, and EO 11990, *Protection of Wetlands*, the OHARNG will also enhance the natural and beneficial value of wetlands. When impacts to wetlands cannot be avoided, they will be minimized.
- Jurisdictional wetlands, isolated wetlands, and deep water habitats at Camp Ravenna shall be off limits to vehicle traffic. These areas will be identified and mapped at a planning level and at a more detailed level as projects are planned and implemented at Camp Ravenna. Within off-road maneuver areas wetlands and ponds shall be identified as no-go areas.

- Wetland areas will not be mowed unless necessary to prevent woody vegetation encroachment as part of our natural resources management strategy, or when these areas are within maintained areas and low vegetation is necessary to support the mission or meet ecosystem management objectives.
- Projects will be evaluated by the Camp Ravenna Environmental Office to determine potential wetland impacts and to determine if a wetland fill permit is needed. Any necessary construction that may unavoidably impact a wetland will be subject to the USACE and OEPA permit process and necessary permits will be acquired prior to construction activity. Jurisdictional and isolated wetlands and other regulated waters delineations and Ohio Rapid Assessment Method (ORAM) classifications shall be completed prior to all construction in areas containing wetlands. The Camp Ravenna Environmental Office will be consulted to determine if wetlands are present and if a wetland delineation is necessary.
- Wetland mitigation will be done in accordance with permit requirements and mitigation sites identified in this INRMP and the Camp Ravenna Master Plan as sites that may not be developed or used for any other purpose than wetland mitigation. These sites will be monitored and maintained in accordance with the permit conditions. If any wetland mitigation sites are excessed from federal ownership, a restrictive covenant will be placed on the site that protects the site as a wetland in perpetuity.
- The OHARNG will support low cost opportunities and cooperative efforts to restore wetlands and riparian areas that do not negatively impact the ability of Camp Ravenna to support training.
- Whenever possible and ecologically sound, dams or other impoundment structures on the installation shall be maintained to prevent the draining of deepwater habitats and to prevent damages from flooding. Those ponds with dam breaches on the installation that are not functioning properly will remain "as is" and may be restored as wetlands when funding becomes available. If approved in a section 404 permit, restoration of these areas may be used to fulfill mitigation requirements from unavoidable impacts to other on-site jurisdictional and isolated wetlands as various training areas are developed.
- Generally, wetlands created by beaver dam impoundments in areas that do not damage infrastructure, roads, and training areas, or create safety and security problems will remain in place. In the event beaver impoundments damage government property or create safety and security hazards, the beaver and the impoundments will be removed in accordance with state regulations and ODOW guidance. Beaver impoundments on major creeks will be prevented. Beaver impoundments slow water flow and change the bottom substrate, which can degrade stream quality and change stream biological communities. To maintain diversity and stream quality, it is the goal of Camp Ravenna to keep all major streams (South Fork Eagle Creek, Hinkley Creek, and Sand Creek) that drain Camp Ravenna free flowing. Specific beaver management procedures are given in **Section 6.3.6**.
- The development of native aquatic vegetation will be encouraged. Aquatic herbicides will be used to control non-native and invasive species and to keep a healthy balance between open water and aquatic vegetation. White amur (*Ctenopharyngodon idella*), an exotic minnow species, will not be stocked and those currently stocked will not be replaced when they die.
- The wet meadows along the north perimeter road east of Paris-Windham Road will be mowed periodically as necessary in the fall to prevent the encroachment of woody plant species.
- Due to the large amount of wetland habitat, in 1990 Camp Ravenna was chosen by the Army to be a participant in the North American Waterfowl Management Plan (NAWMP). In 1993, under the recommendations of the Fish and Wildlife Management Plan, and in accordance with the NAWMP, the USFWS restored/enhanced approximately 22 acres of abandoned

beaver impoundments and created approximately 9 acres of seasonal low water floodings. The main purpose for doing these types of projects is to provide habitat conducive to waterfowl brood production. These areas also benefit many other types of wildlife. The wetlands constructed by the USFWS under the NAWMP in 1992 will be maintained.

- Construction in floodplains will be avoided whenever possible. In instances where the floodplain cannot be avoided, projects will be coordinated with the appropriate County Building Inspector responsible for review of projects in floodplains.
- Impacts to vernal pool areas will be avoided, in order to avoid affects to the specialized invertebrate and amphibian populations they may house.

The Ohio Department of Transportation (ODOT) has expressed an interest in working with the OHARNG on cooperative wetland mitigation projects. No specific projects have been identified but ODOT is primarily interested in stream restoration and headwater protection. Mitigation credits would be shared by both agencies.

6.7 GROUNDS MAINTENANCE

Lands at Camp Ravenna are divided into improved, semi-improved, and unimproved grounds. The locations of the improved and semi-improved grounds are illustrated on **Figure 12**.

Improved grounds can include residential, commercial, and industrial areas; linear infrastructure facilities; and recreational and construction sites. Semi-improved grounds can include altered lands, road shoulders, and other land use areas that require little maintenance. These areas need routine or periodic grounds maintenance. Natural resources management related to grounds maintenance and landscaping focuses on land and water management issues, such as storm water and water quality and pest management. Unimproved areas are those areas that usually receive no grounds maintenance or only occasion maintenance. They make up the bulk of the training area and include streams, ponds, wetlands, forests, shrublands, and grasslands.

Laws and regulations that are associated with grounds maintenance activities include the following, which are described in **Appendix E**.

- EO 13148, Greening the Government through Leadership in Environmental Management;
- Presidential Memorandum (April 1994), Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds;
- Migratory Bird Treaty Act, as amended (16 USC §703-712); and
- Federal Insecticide, Fungicide, and Rodenticide Act (7 USC §136).

An Executive Memorandum, dated 26 April 1994, directs Federal executive departments and agencies to use regionally native plants in landscaping for Federal grounds and federally funded projects. Native species generally provide better habitat for wildlife and have relatively low irrigation requirements. In addition, the use of native species generally reduces the need for pesticides and fertilizers. Landscaping often involves urban forestry. Urban forestry is the maintenance of individual trees or groupings of trees in an urban environment or between dominant land uses. Urban forests are valued for non-consumptive uses such as providing shade, aesthetic value, and habitat for wildlife.

During landscaping and grounds maintenance activities, specific natural resources management includes:

- Using native species in any new landscaping when appropriate;
- Ensuring that BMPs for spill prevention and pollution prevention are followed to protect surface water and aquatic habitats;

- Ensuring that use of herbicides and pesticides are minimized in accordance with Invasive Species and Noxious Weed Control and Integrated Pest Management Procedures (IPMP) strategies;
- Mow grasslands before April 15th and/or after August 15th in areas where possible to minimize disturbance on ground-nesting birds.

Grounds maintenance and landscaping is performed in accordance with federal and state laws and regulations. Camp Ravenna also carries out these activities in accordance with the statewide "Integrated Pest Management Plan (IPMP) for the OHARNG", the OHARNG "Hazardous Materials & Waste Management Plan (HMWMP)", the OHARNG "Final Pollution Prevention (P2) Plan", and the "Camp Ravenna Integrated Contingency Plan (ICP)".

The IPMP describes the installation's pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. Refer to **Section 6.12** for more information pertaining to pest management.

The HMWMP is required by AR 200-1 to ensure compliance with applicable military, federal, state and local rules and regulations pertaining to hazardous material (HAZMAT) and hazardous waste (HW). It is also required by the Ohio EPA Director's Final Findings and Orders (DFF&O's) regarding the restoration program and storage a treatment of reactive (explosive) hazardous waste associated with restoration projects. The OHARNG has a state-wide Hazardous Materials and Hazardous Waste Management Plan and Camp Ravenna has a specific Hazardous Waste Management Plan, which is included within the ICP.

Federal agencies and facilities are required to implement pollution prevention measures as a result of EO 12856. The purpose of the P2 Plan is to prevent, whenever possible, releases of pollutants to the land, air, and water by means of source reduction or elimination. The installation-wide P2 Plan covers 23 vehicle and air maintenance facilities located throughout the state of Ohio. Facilities include Field Maintenance Shops (FMS), Combined Support Maintenance Shops (CSMS), and Army Aviation Support Facility (AASF).

The purpose of the ICP is to consolidate Camp Ravenna emergency response procedures for oil and non-radiological hazardous substance releases and the DFF&Os HWMP requirements into a single document. A Spill Prevention Control and Countermeasure (SPCC) Plan and HWMP have been incorporated into the ICP to minimize the amount of separate plans. The ICP is applicable to a spill or release of oil (petroleum oil, diesel fuel, and gasoline) or a hazardous substance (hazardous materials, wastes, or chemicals and petroleum products). It also identifies hazardous waste management and treatment procedures related to restoration program activities.

Management of improved, semi-improved and unimproved grounds is discussed in **Sections 6.7.1 through 6.7.3** and summarized in **Table 16**. **Figure 13** illustrates the areas that contain restricted and unrestricted mowing at Camp Ravenna. **Figure 14** identifies herbicide management areas. In addition, a Camp Ravenna Vegetation Control Plan has been developed and is included in **Appendix F**.

TABLE 16 : LAND USE CLASSIFICATION OF GROUNDS AT CRJMTC				
LAND CLASSIFICATION		**MAINTENANCE TECHNIQUE (ACRES)[1,2]**		
IMPROVED GROUNDS	**ACRES[1]**	**MOWED**	**WEED CONTROL[3]**	**OTHER**
Cantonment Area 1	60	55	2	3
Cantonment Area 3	73	55	15	3
TTB	140	120	15	5
North Dig Site	25	1	0.5	23.5
South Dig Site	50	2	0.5	47.5
ASP	12	10.5	0.5	1
Building 813	3	1	1.5	0.5
Shoot House	3	1.5	1	0.5
MPMG Range ROCA	6	3.5	2	0.5
MRF Range	25	23	1.5	0.5
CPMPFQC-25 Meter KD Ranges	14	11.5	2	0.5
Improved Grounds Total	**411**	**284**	**41.5**	**85.5**
SEMI-IMPROVED GROUNDS	**ACRES[1]**	**MOWED [4]**	**WEED CONTROL[3]**	**OTHER**
Cantonment Area 1	68	55	10	3
Cantonment Area 2	33	10	10	5
Road and Trail Sidings	450	350	350	450
Perimeter Fence (29.91 miles)	100	100	100	100
Interior Fences (42.21 miles)	125	10[5]	10[5]	10[5]
Power Lines (17.37 miles above, 1.4 miles below ground)	120	120	120	120
Closed Sanitary Landfill (Ramsdell)	11	10.5	0.5	11
Cobb's Pond Picnic Area	4	4	0.5	0
Railroad Classification Yard	30	3	28.5	0.5
Bldg 812	2	0.5	1	0.5
Bldg 813 Parking Area	5	0.5	4.5	5
Group 3	183	15	8	5
Group 4	110	15	8	5
GRP 8	89	50	10	5
ODA#2	23	10	1	1
C-Block Storage	12	1.5	0.5	1
CE Storage	10	2	0.5	1
LL #2 Rd Fuel Point	3	2	2	3
Bore Sight Lane	12	11.5	0.5	0
Slagle DZ	348	100	2	348
YAK Drop Zone	71	65	1	71
NBC Chamber	2	1	1	1

TABLE 16 : LAND USE CLASSIFICATION OF GROUNDS AT CRJMTC				
LAND CLASSIFICATION		**MAINTENANCE TECHNIQUE (ACRES)[1,2]**		
Leadership Reaction Course	8	3	3	8
RT 80 Depot	43	35	5	3
NACA Training Area	18	13	1	6
Dismounted Training Area	6	6	6	0
TA21	73	60	1	2
Training Village	4	3	1	4
Tactical Vehicle Maneuver Area (TVMA)	64	64	2	64
MMPTR (Tank Table II)	171	90	5	171
M203/HG Qualification Range	28	25	3	28
Alt C Pistol Range	3	2	0.5	3
Fire & Maneuver Range	8	1	2	5
MPMG Range Impact Area	256	220	10	256
Live Demo/HG Range	6	2	2	6
Semi-Improved Totals	**2,500**	**1,460.5**	**711**	**1,702**
UNIMPROVED GROUNDS	**ACRES[1]**	**MOWED**	**WEED CONTROL[3]**	**BURN[6]**
Ponds (282 ac) and Streams 242.6 miles, 88 acres)	370	7.5	104	0
Pavement and Railroad Beds	600	100	200	0
Upland Grassland (Primary Grasslands)	145	145	145	145
Young Forest Habitat Management Areas	128	0	0	128
Other Areas	17,529		17529	
UnImproved Totals	**18,772**	**252.5**	**17,978**	**273**
COMBINED TOTALS	**21,683**	**1,997**	**18,730.5**	**2,060.5**

1) Acreage is approximate.

2) More than one technique can be used in a given area, or none may be required. Maintenance on semi-improved grounds is infrequent; on unimproved grounds it is even less frequent.t

3) Weed control in unimproved grounds includes timber stand improvement and invasive species control as needed.

4) Mowed or Burned on Ranges

5) Mowed and Weed Control - UTES, ATC, Tank Compound, and Old Admin. Area Fences

6) Burn in unimproved grounds consists of possible controlled burning of grassland or forested areas.

7) Acreage varies with beaver activity

6.7.1 IMPROVED GROUNDS

General grounds maintenance for improved grounds includes maintaining drainage and lawns. Vegetation management includes regular mowing of grass around the Camp Ravenna Barracks, Armory, and other facilities, weeding, landscape plantings, and weed control using herbicides as necessary. Improved grounds include all areas that receive a high degree of regular grounds maintenance.

6.7.2 SEMI-IMPROVED GROUNDS

General grounds maintenance in semi-improved areas includes maintaining existing drainage, vegetation management using mowing, brush cutting, and herbicides, soil stabilization, and erosion control and repair. Grass mowing and burning are done prior to 15 April and after 15 August as much as possible to minimize negative impacts to wildlife. Grass is mowed at least once per year (more if needed) around the Group 2, Group 3, Group 4, Group 6, and Group 8 buildings, the Depot buildings, and other buildings and areas as needed to support training. Building perimeters are treated with herbicide to control woody plant encroachment. Ranges and Drop Zones mowed at least once per year to prevent woody plant encroachment and may be burned if necessary and conditions are conducive to retain grassland and manage fuel build up. Bivouac areas are mowed as needed to support troop usage. Roadsides are mowed at least once per year and more if needed to support training use. Roadside ditches are brush cut and treeted with herbicide as needed to maintain drainage. The perimeter fence is mowed at least once per year to maintain a clear zone. The size of the clear zone varies based on terrain and the location of the fence in regard to the property line. The standar clear zone is 12 feet outside and 30 feet inside the fence. Vegetation under the fence fabric is controlled with herbicides. Herbicides are also used around building perimeters, mowing obstructions, vehicle parking areas, and un-improved road surfaces as needed.

Demolition Area 2 is occasionally used in conjunction with the environmental restoration program. After detonations, the area is leveled and seeded with an approved grass seed mix. Mowing is done occasionally to prevent woody vegetation growth.

The TVMA (formerly the hay field) is maintained through the use of erosion control measures that prevent soil from migrating off site. Disturbed areas are leveled and seeded. The area is left undisturbed for a period of time after heavy disturbance to allow the soil and vegetation to recover. When possible, training is scheduled when soils are dry. This area is mowed at least annually and is a candidate for controlled burning.

In all TAs, grass seeding is done to prevent soil erosion along roadsides and to stabilize slopes and bare areas during construction. In addition, trees are established to act as sound and sight barriers and to help contain dust generated from tracked vehicles from going off site. Water and/or soil stabilizers are added to dirt trail surfaces to control dust caused by vehicle traffic.

The sanitary landfill (Ramsdell Quarry) was closed in 1990. The OHARNG is required to maintain the clay cap and prevent soil erosion by maintaining the grass cover (approximately 12 acres) and preventing the establishment of woody species. The grass cover was established in 1990 using a seed mix that consisted of 25 percent orchard grass and 15 percent of each of the following: perennial ryegrass, birdsfoot trefoil *(Lotus corniculatus* L.*)*, alsike clover *(Trifolium hybridum* L.*)*, redtop *(Triolium pretense* L.*)*, and annual ryegrass. Seeding was done at a rate of 5 to 8 pounds per acre. This vegetation cover is maintained by annual mowing and seeding as required.

The ECMs used to store active munitions are maintained as semi-improved land at Camp Ravenna, while inactive ECMs are maintained as unimproved grounds (described in **Section 6.7.3**). ECMs are generally in good condition. They are covered with a minimum of two feet of earth cover. Erosion of the earth cover is not a major problem at Camp Ravenna due to the heavy soil and the absence of grazing cattle. Grasses are used to stabilize the earth cover. There are an estimated three ECMs per area with noticeable headwall separation. This results in minor disturbance to the earth cover. Active ECMs are maintained to prevent woody encroachment on the headwall area, to prevent vegetation entanglement in the ventilators, and to minimize vegetation that would propagate a fire. This is done by mowing and herbicide treatments only to ECMs that need treatment. Usually vegetation around the ventilators of active ECMs is treated annually with herbicide. When ground hogs burrow into the earth cover, they are removed and the burrow filled.

Power lines are mowed at least once per year and treated with herbicide as needed to prevent woody vegetation encroachment within the right-of-way. Timber is harvested adjacent to active power lines to minimize the chance for a power outage caused by uprooted trees during wind storms.

There are active water and sewer lines in Cantonment Area 1, Cantonment Area 3 and the TTB. Cantonment Area 3 (Trumbull County) has water and sewer from Newton Falls. The lines are parallel to each other and run along McKibben Road from the East Gate to the ATC and State Maintenance Area. Cantonment Area 1 water lines consist of small lines from four ground water wells that service several of the area buildings. The sewer lines in Cantonment Area 1consist of lines adjacent to George Road and a line the west that crosses under George Road that lead to a mounded and a recirculating septic system north and east of the Main Gate. There is also a sewer line that runs east from building 1067 to a second recirculating septic system east of George Road and south of building 1035. These areas are maintained by mowing.

Other semi-improved areas consist of select internal fences. These are maintained by annual mowing and herbicide treatment under the fence fabric. Other areas such as shower trailers, artillery pads, simulator buildings, the artillery pad after action report building, the above ground fuel point, secondary containment pads, Building 812, various pads and parking areas and portable toilet and gray water holding tanks throughout Camp Ravenna are included as semi-improved grounds and maintained by mowing and herbicide use as needed. Natural resource management is conducted throughout most of the semi-improved grounds.

6.7.3 UNIMPROVED GROUNDS

Unimproved grounds include everything that is not regularly maintained and consists mostly of forested areas, grasslands, and abandoned fields. The empty munitions storage areas, which are mostly forested, are included as unimproved grounds. Minimal drainage ditch maintenance is done. Only drainage problems with the potential to impact active areas and infrastructure are corrected. These are mostly drainage problems caused by beaver flooding. Mowing, brush cutting, and vegetation control with herbicides is done when necessary to support the military mission. Grass mowing and burning are done prior to 15 April and after 15 August as much as possible to minimize negative impacts to wildlife. Forest, wildlife, and other natural resources management actions are taken as described throughout this plan. Controlled burning may be done on grasslands and forested areas, but is generally restricted to dry woodlands to facilitate regeneration of desired species. Grasslands are primarily maintained by mowing.

The actual acreage of ponded water varies from year to year. At one time or another every pond at Camp Ravenna has been impacted by beaver activity. Most ponds on the training site are the result of beaver. When flooding negatively impacts infrastructure, roads, buildings, or training areas the beaver are controlled in accordance with state regulations. Man made and desired beaver ponds are maintained by either natural processes or by annual mowing of the dam. Herbicides are occasionally used to control aquatic vegetation. White Amor fish are also used in some ponds to control vegetation. Muskrat and beaver holes in dams are filled as needed and equipment is available. Old fence is placed along the water side within of earthen dams when the dams are repaired to create a barrier that discourages burrowing animals. Dams beyond minor repair are either abandoned or rebuilt when funding is available.

6.7.4 BORROW SITE MANAGEMENT

Several borrow sites have been designated at Camp Ravenna. These areas are used as sources of inert fill material (for example, sand, clay, and topsoil). The designated sites have been presented to, and reviewed by, the State Historic Preservation Office (SHPO). A list of the areas, and types of material available in each area, is on file in the Camp Ravenna Environmental Office. Fill material will be removed from the designated areas with a backhoe, track shovel, or front end loader. Areas susceptible to erosion will be recontoured with a dozer and covered in erosion matting, fencing, or vegetation. When a borrow site has been exhausted, it will be recontoured and a grass and/or tree cover established.

6.7.5 INFRASTRUCTURE DRAINAGE MANAGEMENT

The major drainage ditches that are maintained at Camp Ravenna are along roads and railroads and throughout semi-improved and unimproved areas. There is an extensive network of man-made

drainage ditches throughout Camp Ravenna. Many drainage ditches have grown up with woody vegetation and are in poor condition. Current maintenance efforts are focused on heavily used areas and where drainage failure has occurred. Brush management is done by mowing, treatment with herbicides, or excavation if necessary. Herbicide treatments done to roadside ditches (and other waters) are regulated by the Ohio EPA under a General NPDES Permit. Permit parameters and requirements must be followed. Where erosion damage has occurred in man-made ditches, they are restored by filling and/or contouring to retore the original ditch, use of geotextile, rip-rap, and establishing vegetation. Grass cover is maintained in ditches to prevent erosion. Repairs are made to chutes, drop inlets, and other structures as necessary.

There are no regularly reoccurring flooding problems at Camp Ravenna that require control measures such as levees. Problem flooding is usually the result of beaver activity. Beaver management is addressed in Section 6.3.6.

6.8 FOREST ECOSYSTEM MANAGEMENT

The forests at Camp Ravenna consist of mixed hardwood forest types. The primary forest types are Beech-Sugar Maple Forest, Oak-Maple-Tuliptree Forest, Oak-Maple Swamp Forest, and Mixed Swamp Forest. Lesser forest types include Mixed Floodplain Forest, Hemlock-White Pine-Hardwood Forest, Ash-Wild Black Cherry-Red Maple Woods, and Oak-Hickory Forest. There is also a number of Red Maple Woods made up of poletimber size trees throughout Camp Ravenna. The current Camp Ravenna forests are the result of timber harvesting in the 1940s when the federal government purchased the land; improvement cuts in the 1970s and 1980s; selective harvesting from the mid 1980s to the present; many years of timber stand improvement; and the reversion of agricultural fields back to forest from the early 1940s to the present. There are approximately 6,400 acres of sawtimber, 5,700 acres of poletimber, and 4,100 acres of adequate regeneration for a total of 16,200 acres of forest land at Camp Ravenna.

The primary objective of the Camp Ravenna Forest Management Program is to support the military missions by providing forest conditions that enable military training while maintaining healthy and sustainable forest ecosystems and meeting regulatory requirements and stewardship responsibilities. Secondary objectives include providing for the production and sale of forest products within the framework of an ecosystem management system, and making the forest management program financially self-sustaining in the short term and generating excess income in the long term. The primary forest product managed for at Camp Ravenna is high quality hardwood sawtimber. Minor forest products include standing firewood, firewood from logging tops, biomass, aspen and basswood chopping blocks, locust posts, and other miscellaneous minor forest products, such as woodchips. Pulpwood may be harvested as an incidental product in salvage sales or as firewood and occasionally as biomass, but it is not specifically managed for at Camp Ravenna. Maximum timber volume production and timber harvesting, with no regard for other forest values and functions, is not a goal of this plan. Camp Ravenna is not, and will not be managed as, industrial forestland.

Timber harvests will be carefully coordinated with military training needs and conducted to provide forest conditions that support training, perpetuate existing forest ecosystems, and meet special biological or ecological needs of rare species. Special consideration is given to the habitat needs of rare species and plant communities when setting up the harvest schedule, determining harvest methods, and when actually in the woods marking the trees for harvest. There are no known federally listed candidate, threatened, or endangered species at Camp Ravenna, although the northern long-earded bat (*Myotis septentrionalis*) is proposed for federal listing in 2015. There are State listed species at Camp Ravenna. If or when harvesting occurs within an area containing federally protected species, the forest management objectives and practices implementation will be modified to meet the habitat needs of the protected species while the overall objective of supporting the military mission and maintaining forest ecosystem function will remain. In this situation the military mission is best served by protecting the listed species and maintaining compliance with the ESA.

On a regional basis, northeastern Ohio forests are a patchwork of disturbance. Most of the forested property is owned by private landowners and a lot of timber harvesting on private land consists of diameter limit cutting of all trees eight to ten inches in diameter at breast height (DBH) or greater, essentially clear cutting. This practice coupled with the abandonment and conversion of farm fields to forest has resulted in a lot of young seedling, sapling, and poletimber forests. Additionally, a lot of previously contiguous farms and forestland are being broken up and sold as lots for residential and industrial development. The result is a landscape of cleared and cut over woodlots and young forests and the disappearance of large tracts of contiguous mature forest. The highly disturbed forests function as habitat for some wildlife species and for the regeneration of shade intolerant tree species, but the benefits and functions of large tracts of mature forest and the species they support are disappearing. The retention of large tracts of contiguous forest is an issue of regional, if not national and international, importance and is one of the objectives of the Camp Ravenna forest management program.

Some important regulations and laws pertaining to forest management include the following, which are described in **Appendix E**.

- Federal Insecticide, Fungicide, and Rodenticide Act (7 USC §136);
- CWA of 1972, as amended (33 USC § 1329);
- ESA of 1973, as amended (16 USC §1531 *et seq*.);
- Migratory Bird Treaty Act, as amended (16 USC §703-712);
- NEPA (42 USC §4321);
- AR 200-3, Natural Resources Management;
- NHPA of 1966, as amended;
- OAC 1501:15-5-12, Ohio Agricultural and Silvicultural Pollution Abatement Law of 1991; and
- SAIA (16 U.S.C 670 *et seq*.)

6.8.1 FOREST MANAGEMENT PHILOSOPHY

The overall forest management philosophy at Camp Ravenna is based on managing disturbance in the forest to reach stated objectives. Disturbance is a natural element in forest ecosystem dynamics. When timber is harvested, the age, species, and functional and structural diversity of a forest stand are modified. Forest management practices will be utilized to manage disturbance and direct change in a manner beneficial for the military mission, the local ecosystem, and regional ecological needs. The Camp Ravenna forests are capable of producing commercial forest products, and forest products will be harvested. This management plan basically concedes that there will be disturbances and changes to the forests, either naturally or artificially induced, and embraces the philosophy of managing forest disturbance for the benefit of the military mission, the perpetuation of the ecosystem functions, and the production of forest products.

The current forest ecosystems at Camp Ravenna are the result of large-scale disturbances caused by construction and past timber harvesting activity. The original disturbances were done in 1940/41 on a large scale and again in the 1970s. The harvests called for in this plan are on a much smaller scale than the original disturbances. This will allow the average sawtimber size and board foot volume per acre of growing stock to increase. These increases will happen slowly over time, mimicking natural processes, while the harvests will provide for local economic benefits and the continuation of the disturbance component to the overall ecosystem.

A modified system of uneven-age management will be practiced at Camp Ravenna. Intermediate harvests, stand improvement harvests, and timber stand improvement will be used to improve the growing conditions of the residual trees, to produce conditions suitable for the establishment of forest

regeneration, and to control invasive species in existing stands. Regeneration harvest will be used in stands and areas within stands where suitable regeneration exists or can be established by such harvests. Specific areas will be managed to develop older, mature forests. Riparian areas will be specifically managed for protection and retention of habitat and water quality. Special treatments may also be used to meet the needs of rare, threatened, or endangered species and unique habitats. Species inventories will be consulted for site-specific recommendations and the necessary controls implemented to minimize and/or avoid adverse ecological impacts due to timber harvesting. This same approach will be utilized in siting training site development and training events in forested areas with the goal of accomplishing the military mission in a manner compatible with environmental stewardship.

Forest management will include three different types, or intensities, of disturbance based on the species composition and size of the forest stand being managed. The most intensive management will be on small, fragmented, highly disturbed areas. A wide range of silvicultural practices will be used in these areas to perpetuate their species composition and structure. Large contiguous forest areas will be managed with silvicultural methods less disturbing to the forest canopy and overall ecosystem structure and function. And a large tract of contiguous forest in the northern portion of Camp Ravenna will be managed on a long rotation to develop and maintain a mature forest with minimal disturbance. This approach will provide a variety of forest habitat conditions suitable for supporting the biological diversity found at Camp Ravenna and will contribute to the regional need for large tracts of mature forest.

- Fragmented forest stands, typically less than 100 acres, are managed to retain vertical diversity, canopy openings, edge habitat, and to regenerate shade intolerant tree species. These areas will be harvested with both intermediate and regeneration harvest cuttings as appropriate. More emphasis will be placed on the regeneration of shade intolerant species in these areas than in the larger blocks of forest. Single tree selection, small group selection, crop tree management, shelterwood, seed tree, patch cuts up to five acres in size, and modifications and combinations of these silvicultural systems will be used in managing these stands. Care in the size and application of harvest cuttings will be used to prevent the conversion to even age management. These forest stands will generally be more intensively managed because they are already fragmented and provide mixed closed and open canopy habitat. The goal is to retain this habitat component and encourage the regeneration of valuable shade mid-tolerant and intolerant species such as oaks and black cherry. This more open condition also provides openings and dense patches of regeneration for troop movement and concealment. Stocking density will be maintained within the B level (well stocked) based on average DBH and basal area except in patch cut areas.
- Contiguous tracts of forest larger than 100 acres will be managed to produce and maintain a mature forest of larger size trees (medium size sawtimber and larger) with a well developed forest canopy. The main silvicultural system used in these forests will be single tree selection harvesting to provide for the removal of specific trees for timber while minimizing canopy openings. Limited small group selection cutting will also be used to try and maintain the presence of shade mid-tolerant species. Crop tree management with the release of a small number of trees per acre may also be used. In instances where species diversity is needed, small patch cuts up to 3 acres in size may be used to remove the canopy and allow sunlight to the forest floor for the regeneration of shade intolerant species. This combination of silvicultural systems will allow for the management of the forest and the removal of timber while maintaining contiguous tracts of forest. Stocking density will be maintained within the upper B level (well stocked) based on average DBH and basal area except in patch cut areas.
- Approximately 1,600 acres of Beech-Sugar Maple-Mixed Hardwood Forest in the north central portion of Camp Ravenna (Special Interest Area, Units 1 and 2) have been taken out of the 10-year cutting cycle and placed on an extended cutting cycle. This area is mostly contiguous forest with only a few roads, a 65-acre Tracked Vehicle Maneuver Area, and a 25-acre engineer dig site training area dissecting it. It contains mainly beech-maple forests

with a mixture of bottomland and other forest types, wetlands, the South Fork Eagle Creek, and the mouth of Sand Creek. It has been identified as containing ecologically significant forest communities and will therefore be managed as a "Special Interest Area", to conserve these communities. This area will be reviewed every other 10-year cutting cycle to determine if a harvest is needed for proper ecosystem management. As with all timber harvesting at Camp Ravenna, harvesting, when needed, will be done to retain and enhance ecological function. There is also a 2 acre area at amphibian/reptile sample point 194 (cutting unit 3-B) that will not be harvested to protect the habitat (older trees and boggy vernal pools) of the four-toed salamander. These areas are eligible for timber stand improvement work to manage invasive species and grapevines.

6.8.2 TIMBER SPECIES TO BE GROWN

Management will emphasize the maintenance and improvement of all species and structural diversity within the forests. The determination of which species will be grown for timber production is based on the soil productivity and the availability of a market for the particular species. Currently, a market exists for all tree species that reach sawtimber size except conifers. All deciduous species will be grown for potential timber trees. Black cherry, sugar maple, black walnut (*Juglans nigra*), red maple, white oak, and northern red oak are the most valuable as timber, followed by white ash, tulip poplar, swamp white oak (*Quercus bicolor*), basswood (*Tilia americana*), bitternut & shagbark hickory, pin oak (*Quercus palustris*), and American beech (*Fagus grandifolia*). White ash will undoubtedly have less of a presence as a timber species at Camp Ravenna due to its imminent decline cuased by the emerald ash borer. The following is a listing of the most common timber species.

- **White Oak**. Generally found on well drained, mesic to dry-mesic sites. A slow growing species, intermediate in shade tolerance.
- **Northern Red Oak**. Generally found on well drained to fairly well drained mesic to dry-mesic sites. More demanding of moisture and more tolerant of cold conditions than white oak; a relatively fast growing desirable tree; intermediate in shade tolerance.
- **Black Cherry**. An opportunistic species often associated with disturbance and forest openings on dry-mesic sites. A fast growing, relatively long-lived species; shade tolerant in youth, becoming intolerant.
- **Black Walnut**. Very sensitive to site conditions. Grows best in warm, deep, fertile, moist, well drained soils on mesic to dry-mesic sites. A fast growing, relatively long-lived species; shade intolerant.
- **Sugar Maple**. Grows on moist, well drained to poorly drained, fertile soils in mesic deciduous forests. Highly shade tolerant; slow-growing; long-lived; often developing heart rot in older tress, especially on wetter sites. Sugar maple is a type of hard maple.
- **Tulip/Yellow Poplar**. Grows in bottoms and beech-maple forests with moist, fertile, sheltered growing conditions, and on margins of swamps. Sensitive to cold and frost conditions. Shade intolerant; very fast growing; moderately long-lived.
- **Red Maple**. Grows in a wide variety of site conditions from upland fields to poorly drained sites and swamps. Shade tolerant; relatively fast-growing; moderately long-lived. A very aggressive colonizer of upland fields.
- **American Beech**. Found in well drained to somewhat poorly drained soils of mesic beech-maple forests. Very shade tolerant; very slow-growing; long lived.

6.8.3 SILVICULTURE

The main silvicultural objective at Camp Ravenna is to use timber harvesting to provide forest stands suitable and capable of supporting military training. This is most often accomplished by implementing the forest ecosystem management objectives of the INRMP and maintaining well stocked, diverse stands

of vigorous and healthy trees. Where specific tree density and forest structure is needed to support military training silvicultural treatments will be guided by those needs. Some additional silvicultural objectives include the growth and harvest of the high quality sawtimber, prevention of stand degradation, maintenance of contiguous tracts of forestland, and providing for salvage sales and other special sales to support mission needs of the OHARNG as they arise.

Generally, uneven-aged management will be used at Camp Ravenna and silvicultural systems to that end will be employed. Single tree and group selection will be the primary harvesting methods. Other silvicultural systems such as crop tree management and modified seed tree and shelterwood systems may be used where necessary to provide for adequate regeneration. Clear cutting, removing every tree four inches DBH and greater, will not be used as a management technique over an entire stand unless a timber salvage disposal is necessary. Small patch cuts from one to five acres may be used if necessary to manage species diversity and regenerate shade intolerant species. The silvicultural system will be matched to the condition, needs, and the management objectives for the forest stand as described in the Forest Management Philosophy section of this INRMP. The use of uneven aged silviculture will maintain the size, age, and structural diversity of the Camp Ravenna forests. The limited use of modified even-age silviculture will help maintain species diversity. Multiple factors including military training needs, the size of the forest tract, tree spacing, tree form, tree health, species diversity, DBH's, existing forest regeneration, proximity to a riparian area, habitat type, habitat quality, and rare species needs will be taken into consideration in silvicultural decision making. Computer harvest simulation programs may be employed to assist in making silvicultural decisions.

- Single Tree Selection is a silvicultural system used to manage uneven aged or all aged stands by removing single trees throughout the stand across all age classes to produce and maintain a diverse age distribution of trees. Stands managed with this system will have a wide size distribution of trees. There is usually minimal disturbance to the forest canopy and minimal sunlight penetration to the forest floor after the harvest, which limits the development of smaller size class trees in stands with a large component of shade intolerant species. For this reason single tree selection by itself is seldom the best choice for maintaining species diversity. For example, when American beech is present in the overstory it often becomes densely established as both primary and advanced regeneration out-competing other species. To maintain species diversity in the forest timber stand improvement to deaden some of the beech and help other species establish regeneration is needed in conjunction with harvesting. The selection of harvest trees would be biased toward decreasing the abundance of American beech and leaving less shade tolerant species in the stand. Single tree selection is best suited for managing shade tolerant species and forest types such as Beech-Sugar Maple Forest.
- Group Selection is similar to single tree selection but small groups of trees are selected for removal in an effort to produce small canopy openings needed for the regeneration of shade intolerant species. The openings are small, usually under ¼ of an acre, and attempt to imitate natural canopy disturbance caused by wind and other natural agents. Openings are usually made around shade intolerant trees by removing the shade tolerant trees. Care must be taken not to make canopy openings where grapevines are present because the vines will take over the opening and prevent trees from regenerating.
- Crop Tree Management or Crop Tree Release is a silvicultural system used to concentrate volume production on a few selected crop trees. It can also be used to increase the production of mast on selected trees. The principle of crop tree release is based on getting sunlight to the crowns of selected crop trees. This is done by removing trees that have crowns competing with the selected crop trees. Understory vegetation and trees not competing with the crowns of selected crop trees are not considered for removal. The increased sunlight allows for the development of a fuller crown and the production of more biomass in wood fiber and mast. The intensity of disturbance to the forest depends upon the number of crop trees picked per acre. The more crop trees that are picked the more competing trees need to be cut and the greater the disturbance to the forest canopy. This

method can be used in both mature forests and poletimber size stands. In mature forests the trees removed around the selected crop trees are harvested for their commercial value. In poletimber stand crop tree release is done as a timber stand improvement operation or if possible as a firewood harvest operation. The most common application of the system is in conjunction with single tree selection and group selection in commercial harvests to release shade intolerant trees, species with a limited number of stems in the forest, or trees with the potential to become high quality veneer or sawtimber stems. Usually only a small number of trees are released per acre to minimize canopy disturbance. In this regard crop tree management is a valuable tool in managing the forest ecosystem because it concentrates disturbance around a few selected trees and leaves the majority of the forest undisturbed.

- Shelterwood and Seed Tree are two silvicultural systems usually considered as regeneration systems. These are usually applied to produce an evenaged stand of trees. The systems vary in the basal area of shelter or seed trees left after a harvest. In the shelterwood system more basal area is left than in the seedtree system. The intent of these systems is to provide enough light, protection, and seed to regenerate a stand. This is done by harvesting all but 15 to 40 square feet of basal area in seed producing trees. Once advanced regeneration is established under these residual trees they are harvested and the result is an evenaged stand of trees. These systems have merit at Camp Ravenna in the regeneration of shade intolerant species in forest otherwise dominated by shade tolerant species. They are applied selectively on a small scale to help retain species diversity while avoiding conversion of stands to an evenaged condition.
- Patch Cutting is also a forest regeneration method. It consists of harvesting all trees within a given area and therefore making an opening in the forest canopy which allows for regeneration. Patch cuts can be of any size up to 5 acres. Patch cutting is rarely used at Camp Ravenna but must be an available tool in the overall forest management program. This system will tend to produce evenaged stands and so must be applied at a scale appropriate to regeneration needs required to maintain species diversity. This method is also utilized in young forest initiatives, where scrub-shrub areas are cleared to create wildlife habitat and vertical structure.

Harvesting at Camp Ravenna will be done as intermediate treatments to improve forest conditions and long term sustainability of ecosystem functions, as sanitation treatments to remove damaged and diseased timber, to salvage timber to facilitate training missions and construction projects, and to regenerate and perpetuate forest ecosystems in perpetuity. Firewood and biomass sales of smaller and/or understory vegetation may also be used if/as needed to achieve desired management goals and objectives.

Controlled burning may be used in the management of forest ecosystems to control undesired vegetation, to aid in the establishment of shade mid- and intolerant species, and to maintain diversity and ecological function. Fire is not a common feature within Beech-Maple Forest, which is common at Camp Ravenna, but there are some Oak-Hickory Forests and varients of Beech-Maple Forests with a high oak component that may benefit from a controlled burn. If burning is used, the stand would be evaluated prior to burning to determine its suitability. Burning would be done in accordance with the current Camp Ravenna Integrated Wildland Fire Management Plan.

6.8.4 TIMBER ROTATION

Rotation is the period of years required to establish and grow timber crops to specified condition of maturity, or in other words the age of trees when ready to harvest. Rotation age at Camp Ravenna will be based on the size and marketability of individual trees. Harvests will not be conducted based on a set rotation age. Rather, uneven aged silviculture will employ group selection along with single tree selection between groups to maintain mixed species, uneven-aged stands.

All size and age classes are subject to be harvested to meet the management objectives in a particular area, but there are some general guidelines that can be used to determine when certain species have reached financial maturity and harvesting should be considered. At Camp Ravenna, the growth rate of northern red oak usually begins to slow down when trees are between 70 and 80 years old. Under good growing conditions these trees will have a DBH between 24 to 32 inches (average of 28 inches on site index 70 -75), and are at their best for size, soundness, and value. Usually at this age, these trees are financially mature because their growth rate is less than the expected interest rate of a like value cash investment.

This same principle of reduced growth rate can be used for other species also. Taking into account site productivity variations, a rule of thumb relationship between financial maturity and DBH exists. Based on experience with the site/species relationships at Camp Ravenna, tree decline/internal defects can be predicted from the DBH, and trees ready to be harvested can be determined. The following DBH ranges can be used as a rule of thumb:

- White oak - 22 to 28+ inches
- Northern Red Oak - 24 to 34+ inches
- Black cherry - 20 to 26 inches
- Black walnut - 24 to 30 inches
- Sugar maple - 22 to 28+ inches
- White ash - 18 to 26 inches
- Yellow poplar 24 - 32+ inches
- Red maple - 20 to 28+ inches
- American beech – 12 to 24+ inches

Some of the high value trees can actually increase in value due to a reduced growth rate (tighter rings) if they are veneer quality. Trees can be left to grow to larger DBH's with little impact in most instances. Unless the trees are damaged or exposed to undue stress, they will continue to be healthy and grow at a reduced rate for some time.

The decision to harvest a tree or not to harvest is not based solely on its size but rather on a number of factors including it's overall health and vigor, the management objectives for the stand, the presence or absence of similar size or larger trees, the presence or absence of advanced regeneration, habitat and wildlife considerations, and other factors. DBH is used as one criterion among many when determining which trees to mark for removal in a harvest.

6.8.5 TIMBER HARVESTING

In accordance with the multiple use requirements found in DoD Instruction 4715.03, forest products will be managed for and harvested at Camp Ravenna. Accepted logging BMPs will be utilized during all timber harvests. Minor forest products, which include aspen trees, locust posts, standing firewood, and firewood from logging tops will also be managed and sold. Other minor products may be managed for and sold as markets become available. Firewood sales consist primarily of logging tops left on the forest floor after timber harvests. The sale of this material helps keep harvested forest areas accessible for training. A portion of the tops are always left in the woods to provide habitat for snails, shrews (a gypsy moth predator), and other fauna.

6.8.5.1 MISSION COMPATIBILITY AND COORDINATION

Timber harvest locations are coordinated with the Camp Ravenna staff to ensure mission compatibility. The training staff coordinates bivouac and tactical concealment site locations with the Camp Ravenna Environmental Office. Timber is thinned and/or salvaged as necessary in these locations to facilitate training requirements. Military construction projects are also coordinated with the Camp Ravenna

Environmental Office, who assist in siting new construction and ensures merchantable timber is salvaged.

Timber harvesting has been done within load lines and other AOCs. The contamination in the AOCs is generally localized around production buildings, waste water treatment facilities, and burning and demolition areas. Detailed information on the nature and extent of contaminates is available in remedial investigation reports. The Camp Ravenna Environmental Office and the RVAAP IRP team work together to ensure that training and forest management activities do not conflict with the RVAAP IRP.

6.8.5.2 TIMBER SALES

Annual timber sales are accomplished by submitting a Report of Availability (ROA) that describes the timber and the terms and conditions of the sale to the NGB through the USP&FO for Ohio. The NGB then forwards the ROA to the USACE, Louisville District for processing. The USACE functions as the real estate agent for the timber sale and solicits bids and collects payments. The USP&FO for Ohio may also act as the real estate agent for timber sales if desired.

Minor forest products are sold locally at Camp Ravenna in accordance with the *Memorandum to Military Departments on Timber Sales Program Policy and Coordination, June 7, 1983*. (DUSD, 1983), Corps of Engineer regulations on small sales of real property, and AR 405-90. A Minor Forest Products Sale Procedure has been in place since 1994 and is updated as necessary to reflect revisions in Army guidance. Under this procedure Camp Ravenna sells minor forest products such as firewood, locust posts, and woodchips on a per unit price permit basis and emergency and salvage sales of sawtimber up to $5,000 on a case by case basis. The Camp Ravenna Environmental Office administers the minor forest product sales program. Sales are open to the public. Accumulated receipts are forwarded to the Louisville District Engineer for processing to the Defense Finance and Accounting Service (DFAS) and deposit into the Army Forestry Account. The intent of the program is to efficiently utilize available by-products of timber sales and other low value forest products, to salvage small volumes of timber generated by unplanned construction projects, to salvage small volumes of forest products damaged by natural disasters, and to provide a means to sell small volumes of specialty products such as biomass, woodchips and locust posts. Any number of minor forest products may be sold under the program to include firewood, aspen chopping blocks, locust posts, small volumes of sawtimber, biomass, woodchips, and miscellaneous other products. A copy of the minor forest products sale procedure is included as **Appendix G**.

6.8.5.3 SALE ADMINISTRATION AND INSPECTIONS

The Camp Ravenna Environmental Office manages the Camp Ravenna forest management program and determines the need for timber harvests. The USACE acts as the Contracting Officer's Representative for timber sales at Camp Ravenna. Reports of availability are developed by the Camp Ravenna Environmental Office for signature by the Camp Ravenna Commander. When signed by the Camp Ravenna Commander they are forwarded to the USACE Louisville District through the USP&FO for Ohio and NGB-ARE conducts daily inspections of harvest operations. The USACE develops invitations to bid, administers sale contracts, and collects and deposits sale proceeds. The USAEC also assists in marking timber. Frequent sale inspections are conducted by the Camp Ravenna Environmental Office. The USACE forester is kept informed on harvest progress and any problems that have developed and makes periodic inspections. The USACE provides the installation with monthly and yearly summary reports of the volume and value of forest products harvested at Camp Ravenna.

Upon completion of a harvest operation, the Camp Ravenna Environmental Office and the USACE conduct a walk through of the harvest area to inspect for compliance with the sale contract. Any deficiencies are noted and the contractor notified. Site restoration must be completed in accordance with the terms of the sale contract before the contractor's performance bond will be returned. Once the site has been adequately restored a completion notice is signed by the USACE, Camp Ravenna, and the contractor and the performance bond is returned.

6.8.5.4 SALE SIZE

The majority of timber buyers within the Camp Ravenna area are relatively small operations. There are a few large mills, but most are small with limited buying power. For this reason, and to encourage the participation of smaller mills in the Camp Ravenna harvesting program, an attempt is made to keep single sale volumes to 300,000 board feet, Doyle Rule or less. Multiple smaller sales will be used to harvest large quantities of timber as much as is practical depending upon the circumstances prompting disposal and the costs of sale administration. These factors will be reviewed when sales are marked and a final determination as to the sale size, that is sensitive to the local market and most beneficial to the Government, will be made.

6.8.5.5 ANNUAL ALLOWABLE HARVEST

The majority of the forest stands at Camp Ravenna are well stocked. The average sawtimber volume is 5,162 board feet (Doyle Rule) per acre. The actual stocking (relationship between average tree diameter and the number of trees) is adequate and the sawtimber volume is average for this part of the state. The average volume in northeastern Ohio, when only sawtimber acreage is considered, is approximately 6,746 board feet Int 1/4-inch Rule, or about 5,000 board feet Doyle Rule (1992 U.S. Forest Service Inventory). It is not unlikely for a quality stand of large sawtimber to have somewhere between 7,000 to 10,000 board feet, Doyle Rule, of sawtimber per acre. A long-term management objective is to increase the average sawtimber volume on sawtimber acreage to at least 7,000 board feet, Doyle Rule, per acre.

Based purely on growth, without any regard for size, quality, and ecosystem objectives, the sustainable annual harvest is equal to the total annual growth of approximately 840,000 board feet. Harvesting based solely on annual growth would remove many small trees (12 to 18 inches DBH) over a large acreage each year and would allow for no net growth in standing timber volume. This approach would result in the perpetual harvesting of trees before their financial and biological maturity, and does not consider training support requirements and other ecological objectives. The harvest scheme to be used at Camp Ravenna will facilitate support of the military mission, retention of forest ecosystem function, and increases in sawtimber sizes, volume, and quality. The annual harvest will be up to approximately 50 percent of the 10-year growth of a given compartment. This harvest will come from stands throughout the compartment using silvicultural methods identified in this plan.

6.8.5.6 TIMBER HARVEST SCHEDULE

The harvest schedule consists of harvesting in one Forest Management Compartment per year starting with Compartment 1 and proceeding through Compartment 10 (**Figure 10**). The entire cutting cycle will take 10 years to complete. The forest inventory will be consulted to determine the allowable harvest based on 50 percent of the 10-year growth and to identify cutting units capable of supporting the scheduled harvest. The Camp Ravenna Environmental Supervisor who is a Certified Forester will field verify the recommendations found in the inventory. Timber harvesting will be utilized to support military missions and training site development and construction projects. The balance of the allowable harvest will be directed at meeting general ecological needs of the stands within the Compartment scheduled for harvesting. Less than the maximum allowable harvest of 50 percent of the 10-year growth may be harvested if forest conditions can not support the maximum harvest while meeting training and ecological objectives.

Merchantable timber will be salvaged from all construction sites when present. When construction projects require a large volume of timber to be harvested (equal to or greater than the allowable harvest volume), the programmed timber harvest schedule will be suspended and the annual harvest will be generated from the construction project timber salvage. The maximum allowable harvest may be exceeded when conducting timber salvage for approved construction projects. The original harvest schedule will be delayed until the salvage is complete. The compartment containing the salvaged area will be skipped in the ten-year harvest cycle. Timber may also be salvaged from forest stands damaged by insect and disease outbreaks or as a silvicultural tool to prevent or minimize such outbreaks.

Table 17 has been developed to identify 50 percent of the 10-year growth for the identified compartments and will be followed as closely as possible as the allowable harvest per compartment during the 10-year harvest cycle. Adjustments to harvest volumes may be made due to variations in projected growth and salvage operations. Adjustments may also be made in the schedule order if necessary to support mission or ecological needs. The estimated proceeds are based on harvesting the entire allowable volume, and will vary based on the actual amount harvested and market conditions.

TABLE 17: TIMBER HARVEST SCHEDULE FOR CRJMTC, FY 15-24

YEAR	COMPARTMENT	ANNUAL ALLOWABLE HARVEST (BOARD FEET, DOYLE RULE)	ESTIMATED SALE PROCEEDS BASED ON ALLOWABLE HARVEST
2015	3	470,000	$140,000
2016	4	506,000	$165,000
2017	5	678,000	$230,000
2018	6	350,000	$115,000
2019	7	400,000	$130,000
2020	8	250,000	$80,000
2021	9	250,000	$80,000
2022	10	425,000	$140,000
2023	1	400,000	$125,000
2024	2	300,000	$100,000
Totals		**4,029,000**	**$1,305,000**

For a more detailed schedule of the planned Timber Harvest Schedule from FY13 through FY19, refer to **Appendix H**. Forest compartments are depicted in **Figure 10**.

6.8.5.7 TIMBER MARKING

Qualified Personnel. Timber marking will only be done by professional foresters familiar with the goals and methodologies of this plan. The Camp Ravenna Environmental Supervisor is a Certified Forester and will conduct and/or supervise all timber marking. For six years, the Natural Resources Manager worked as a private lands Service Forester with the Ohio Division of Forestry and has experience marking and preparing timber sales. Marking assistance is available from the Louisville Corps of Engineers Forester.

Field Procedure. All standing timber sold at Camp Ravenna will be clearly marked with several paint marks at eye level and at ground level. All tree marking will be done in accordance with the methodologies identified in this plan. The forester marking the trees will select, measure, mark, and tally all trees for sale. Cull trees to be felled will be marked with an "X". Cull trees to be deadened and left standing will be marked with an underlined "X". These trees will be girdled with two complete girdles at least one inch deep and no more than four inches apart from each other.

Trees selected for sale will be marked on the stump and on the bole near eye level with tree marking paint (orange or blue). Marking will be carried out in strips to provide complete coverage of the woods. Paint marks will be made on two to three sides of the tree, so the markings can be seen from all directions. At least two stump marks will be made on each marked tree.

Trees marked will be 100 percent tallied in the field. The tally will be made for each individual species in two inch diameter classes and to the nearest half log length (8 foot). This tally will be used to calculate the volume of the marked standing timber. The Doyle Log Rule, Form Class 78 for estimating the volume of standing trees will be used as the official unit of measure. The International ¼" Rule volume will be provided as information only.

Marking Criteria. Each individual tree and the surrounding area are evaluated to ensure ecosystem relationships are considered prior to marking trees for removal. The overall goal is to keep all functioning parts of the ecosystem intact in perpetuity. The timber will be marked to make up missing functions and retain existing functions. All size classes and conditions of trees are subject to removal or retention to meet the needs of the ecosystem and forestry objectives.

The following site characteristics are considered, and questions asked, when marking timber. Adjustments are made in trees selected for harvest, harvest timing, and harvest operational requirements accordingly:

- Is the stand condition suitable to facilitate training need?
- Is the stand larger or smaller than 100 acres?
- Is the forest at or near climax species composition?
- Is there advanced regeneration of desirable species?
- Are the tree species mostly shade tolerant or intolerant?
- Is special effort needed to retain shade intolerant species?
- Canopy condition, open or closed and what is desired?
- Is the density and distribution of sawtimber size trees adequate to support a harvest?
- What is the stocking density?
- Is there adequate horizontal and vertical structural diversity?
- Is the forest part of a headwater area?
- Are there springs, small creek, or streams?
- Is the timber located in a riparian area?
- Are there adequate mast producing trees?
- Are there adequate live den trees and standing dead trees?
- Are there rare species and specific habitat needs to consider?
- Is there potential for soil erosion?
- Are there equipment limitations due to soil type and/or soil wetness?

Some of the characteristics reviewed when evaluating trees to mark are listed below. Again, appropriate adjustments are made in marking the trees based on tree condition and management objectives:

- Is the tree species shade tolerant or shade-intolerant?
- Are there other mature trees of this species in the stand?
- Is there advanced regeneration if this species in the stand?
- Will harvesting this tree remove this species from the forest?
- What is the crown position, dominant, co-dominant, intermediate or suppressed?
- What is the crown condition, large dead or broken limbs in crown, healthy foliage?
- What is the condition of the trunk, straight, leaning, sweep, crook, scars, seems, fungi?
- Are there signs of butt or heart rot plainly evident or detectable by sounding?
- Are there low forks in main trunk or a weak crotch?
- What is the root condition, healthy or seriously defective or sprung?

- Are there other signs of health problems such as gypsy moth egg masses/caterpillars/ emerald ash borer?
- Is the DBH at financial maturity?
- Is the tree of sufficient size and quality to be merchantable?
- Will the tree become more valuable if left to grow?
- Are there large holes in the trunk (May be retained as a den tree)?
- Is the tree an active den tree?
- Is the tree a mast producer and are there other mast producing trees in the area?
- Are there old or recent mechanical injuries to trunk or roots?
- Does the tree have exfoliating or loose bark suitable for bat roosting?
- Does the tree pose a hazard to the harvesting operation or to military personnel using the area?

6.8.5.8 LOGGING OPERATIONAL REQUIREMENTS

Logging operations will be done in accordance with BMPs to minimize negative impacts to water, soil, and the forest ecosystem. BMP guidance is available in the BMPs for Erosion Control on Logging Jobs in Ohio (ODNR Division of Forestry), Rainwater and Land Development, Ohio's Standards for Stormwater Management, Land Development, and Urban Stream Protection (ODNR, OEPA, NRCS), and the USGS Water Resources Inventory for Camp Ravenna. The following general guidelines will be used during timber harvest operations:

- Skid trails and log landing locations will be identified prior to putting equipment in the woods and will be laid out to avoid wet depressions, vernal pools, seeps, and headwater creeks.
- Skid trails will be laid out to avoid special habitat and rare species areas.
- Skid trails will be laid out to keep a minimum of a 50 foot buffer around significant cultural resource sites.
- Skid trails and logging operations will be laid out to avoid environmental areas of concern.
- Main skid trails will not be placed in riparian areas. Riparian zones will be defined as the area surrounding "blue line" streams identified on USGS, 7.5-minute topography maps (**Figure 4**). The buffer zone around riparian areas varies based upon slope:
    - A 0 percent slope requires a 50 foot buffer;
    - Up to 10 percent slope requires a 95 foot buffer; and
    - Up to a 20 percent slope requires a 130 foot buffer.
- Culverts and/or bridging will be used to cross waterways and they will be crossed at right angles.
- All slash and logging debris greater than six inches in diameter will be removed from drainage channels.
- Logging will be temporarily stopped if excessive rutting occurs.
- Ruts in main skid trails, log landings, and other areas dry enough to work on will be leveled.
- All non-forested bare earth areas will be seeded and mulched with a Camp Ravenna approved native seed mix.

- Fueling locations will be located on firm level ground away from wetlands, creeks, ditches, or other sensitive areas. Adequate spill response material will be on site.
- Fuel spills will be cleaned up by digging up and removing contaminated soil. The Camp Ravenna Environmental Office will be notified immediately of any spills.
- All trash and bar oil jugs will be removed from the harvest area.

6.8.6 TIMBER STAND IMPROVEMENT

TSI is used at Camp Ravenna to help maximize the usability of forests for training while retaining ecosystem function and improving forest conditions for regeneration and timber growth. TSI efforts are focused to control invasive species, to improve conditions for the regeneration of shade intolerant species, and to retain species diversity. TSI work is done in specific problem locations dominated by invasive species such as grapevines, where needed to help establish regeneration, around shade intolerant species, and to release crop trees in pre-commercial stands. Other areas are left untouched so as not to disrupt the forest structure and function. This approach supports training, allows for the production of high quality timber products, encourages the retention of species diversity, and minimizes ecological impacts. TSI is not done to remove all non-timber species, all understory vegetation, or all poorly formed or cull trees in an effort to grow only high quality timber trees.

The primary TSI method will consist of severing unwanted vegetation. Severing without the use of herbicide will be used if effective in achieving desired control. As much as possible, vine treatments will be done prior to harvesting to reduce the need for herbicides. Herbicides will be used when mechanical methods alone are not sufficient or light conditions are such that growth will occur without their use. Only USEPA approved herbicides that are relatively non-persistent in the environment will be used. Picloram (Tordon) will not be used. Standard 2,4-D or Triclopyr containing products and other non-persistent products will be used. Herbicide treatment for vines generally consists of either cutting the vine 15 to 18 inches above the ground and spraying a small amount of chemical on the cut surface and lower stem, or just removing the leaf litter from the vine and treating the lower 15 inches with herbicide (basal treatment).

In addition, non-merchantable cull trees in timber production areas are removed by felling or girdling during timber harvests or by a combination of felling and girdling and herbicide use in TSI treatments. Large culls may be felled but usually will be girdled and left standing to provide snags for wildlife utilization. Girdled trees will usually continue to live for a year or two and continue to produce mast and provide a live den tree. This type of deadening causes a less dramatic change to the ecosystem while meeting timber management objectives.

Not all low value and cull trees are removed. More emphasis is placed on removing these trees in the intensively managed woods than in the larger, less intensively managed woods. Cull trees considered unique or critical may be retained within the intensively managed areas. A minimum of between two to five wildlife trees (dens, snags, and mast trees) are retained per acre. Trees with exfoliating bark and active wildlife nests or dens are left standing.

Occasionally a TSI treatment may involve the foliar application of herbicides to deaden dense shrubs and groundcover. This treatment is particularly helpful in areas overstocked with American beech where less shade tolerant trees have been removed by previous harvesting. To regain species diversity the beech understory may be treated and a large portion of the beech overstory removed by harvesting and trees of scarce species retained. This will afford the less shade tolerant species a chance at re-establishment. The shade tolerance of the beech assures their continuance as part of the forest ecosystem.

Small TSI jobs may be done by the Camp Ravenna training site staff under the direction of the Camp Ravenna Environmental Office. Larger jobs will be contracted. All chemical applications will be done by properly certified State or DoD individuals. The Camp Ravenna Environmental Supervisor is currently State certified to apply pesticides.

Stands throughout Camp Ravenna are in need of TSI with grapevine control as the number one problem. A reasonable amount of work will be programmed each year to support training site management needs without incurring undue costs. Cutting units will be reviewed for TSI needs during the timber harvest evaluation process and during general forest inspections. Work will first be scheduled to precede areas scheduled for timber harvest and secondarily in problem areas throughout Camp Ravenna. As grapevine infestations are brought under control TSI work will focus more on crop tree release in pre-commercial stands and regeneration establishment.

Requirements for threatened and endangered species sucha as the timing of tree felling and ensuring adequate habitat trees are left standing or created by girdling are taken into consideration when implementing TSI operations. Minimum amounts of herbicides are used utilizing cut stump, basal bark, or girdle and fill application methods, which prevent non-target application.

The planned TSI Schedule for FY13 through FY18 is provided in **Appendix H**. Forest compartments are depicted in **Figure 10**.

6.8.7 TREE PLANTING

Tree planting is not required to regenerate hardwood forests after harvesting. The Camp Ravenna uneven-age forest management program is designed to perpetuate forests without planting. Planting can be used to augment the regeneration of shade intolerant species in forests managed for continuous canopy cover. A dense canopy cover inhibits the regeneration of oaks, black cherry, yellow poplar, white ash, and other shade intolerant and mid-tolerant species. The need for such inter-plantings will be determined when the stand is evaluated for harvesting potential. Plantings would be made in small canopy openings left after the harvest. This is not the preferred method of forest regeneration, but can be used to retain species diversity when needed.

Planting of abandoned farm fields has been discontinued at this installation since 1965, after planting failures from heavy deer browse and poor site/species selection. However, some white oak plantings from 1956 have survived and are up to 20 feet tall. White ash has demonstrated a similar ability but is not quite as hardy as white oak.

In 1986, red oak was planted in various places over a 30-acre area. Some of them survived, but many were damaged or killed by mammalian herbivory (probably deer).

In 1989 a small test planting was conducted with white and red oak using tree shelters. It was hoped that the shelters would make up for the poor site conditions and prevent deer browse damage. The shelters worked in preventing browse damage, but did nothing to offset the poor site conditions. The survival rate was 20 percent the first year and less than ten percent the second year.

One other attempt was made in 1991 to reforest an area for the commercial production of timber. Red oak, sugar maple, and a few Chinese chestnut (*Castanea mollissima*) were planted on a ten acre abandoned agriculture field. Site preparation consisted of brush-hogging. After planting, a spot treatment of herbicide to kill competing grasses was applied. The first year survival was around 90 percent. Since then, survival has steadily declined and growth on the surviving trees is minimal.

Attempts have been made to artificially regenerate forests at Camp Ravenna, but all have met with failure or minimal success. Deer enclosures could probably be used and intensive herbicide and fertilization efforts made to improve success, but the cost would not be justified by the return. The deer herd will continue to be a major factor at Camp Ravenna for the foreseeable future, and the site conditions will not change. The best way to reforest Camp Ravenna is to allow natural processes to occur and possibly augment them with a direct seeding effort. Reforestation is not a major priority. There will be no organized tree planting done at Camp Ravenna for the purpose of growing commercial timber. Most fields will be left to regenerate naturally, and to provide a valuable habitat component at Camp Ravenna.

Tree planting may be done in support of training needs. In such cases, the project will be coordinated with the Camp Ravenna Environmental Office. Native species will be used to the greatest extent possible.

6.8.8 FOREST INSECT AND DISEASE MANAGEMENT

Consideration of the forest health is included in all TSI, thinning, and harvest operations at Camp Ravenna. An effort is made to create conditions that favor the survival and increased vigor of forest trees. It is understood that disease plays a role in the ecosystem and that dead trees are a valuable part of the ecosystem, but diseases will not be allowed to take control of major forest systems without some attempt to combat them. The best way to combat forest pest problems is prevention. The focus at the Camp Ravenna program is to keep the trees and forests growing vigorously, so they can defend themselves.

Native insects and diseases have less potential to cause large scale problems than introduced species. They are present in the forest as a valuable part of the ecosystem. Under normal conditions a state of equilibrium exists between forest insects and diseases and their hosts. They serve as a natural agent to remove weakened individuals and are valuable agents in the recycling of nutrients. A healthy forest is not devoid of insects and diseases, or of dead and dying trees, but rather is in a state of equilibrium with a mixture of many organisms, none of which is the single dominant factor controlling ecosystem processes.

Forest health problems normally occur when the ecosystem is subjected to an unusual outside stress, or complex of stresses, such as air pollution, drought, flooding, military training, soil compaction, or fire. Under these stress conditions, trees and the forest are not able to combat normally occurring insect and disease activity, because energy is being used to combat the stress factor(s). Generally tree vigor is reduced and they are predisposed to health problems. Non-native insect and disease pests are especially a problem under these conditions. Trees are not adapted to combating these pests and there are few, if any, natural controls in the ecosystem for these pests. For this reason, particular attention is given to identifying and monitoring non-native forest pest at Camp Ravenna.

State regulations are in place to control and prevent the spread of a number of invasive species and plant diseases to protect the health of Ohio's plants and prevent massive economic losses to the nursery, timber and tourism industries and the communities they serve. Movement of forest products harvested at Camp Ravenna is subject to both state and federal quarantines and other applicable regulations.

6.8.8.1 GYPSY MOTH MANAGEMENT

One of the most potentially destructive pests at Camp Ravenna is the gypsy moth. This pest is a defoliator of almost all the hardwood species that grow at the installation, and has the potential to cause large-scale death and destruction. Monitoring efforts have been underway at Camp Ravenna since the mid-1980s in cooperation with the USFS. Up until 1997, each year 135 milk carton type pheromone traps were placed at permanent trapping locations at one-half mile intervals throughout the installation. Trapping was stopped after the 1997 season because the number of moths per trap was over 1,000 for two consecutive years. At this population level, egg masses and larvae are common. The USFS now monitors the moth with aerial defoliation surveys and drive through egg mass surveys.

The first gypsy moth defoliation event occurred in 2000. Approximately ten acres of mixed beech-maple and swamp white oak forest north and south of South Service Road, just east of Load Line 4, and a small 0.5-acre area on the southwestern perimeter by the oil wells were defoliated. Caterpillar cadavers, killed by the parasitic fungus (*Entomophaga maimaiga*), were found throughout the defoliated areas and other forests on the installation. The defoliation progressed through mid-June and then stopped, and the trees began to leaf out again. It is believed that fungus killed the caterpillars and enabled the trees to recover to some degree. A few white oak and beech trees were lost in these areas but the overall impact was not noticeable. The gypsy moth is in check at the present time.

Camp Ravenna has a diverse mixture of species and a lot of wet woods. Killing gypsy moth defoliation events in Ohio and Pennsylvania occur mainly on dry oak ridges. Dry oak forests are not present at Camp Ravenna. The most susceptible stands are open, scrubby oak forests with numerous structural features such as bark flaps, wounds, and bark fissures with little or no leaf litter on dry sites. Resistant stands grow on moist, deep well drained soils, lack the above mentioned structural features, have a deep leaf litter, and a high diversity of species with a good growth rate (Gypsy Moth News, Issue No. 34, USFS). The best long-term management strategy seems to be the maintenance of a vigorous diverse forest. Species such as cuckoos, shrews, and the white-footed mouse (*Peromyscus leucopus*) are known predators of the gypsy moth. Management practices such as maintaining large tracts of forests with an intact canopy and retaining large woody debris and leaf litter will encourage these natural predators (Herms and Shetler, 1998).

Camp Ravenna will continue to cooperate with the USFS in the monitoring effort and to manage the forests to maintain diversity and long term ecosystem sustainability. There are no pesticide or biological treatments scheduled or planned for the next five years. If the Forest Service considers such a treatment necessary, the proposal for treatment will be reviewed by the OHARNG, cooperating state agencies, and the NGB. If deemed necessary, a separate environmental evaluation under the NEPA will be conducted for aerial application of biological or chemical pest control agents.

6.8.8.2 EMERALD ASH BORER (*AGRILUS PLANIPENNIS*) MANAGEMENT

Monitoring at Camp Ravenna for the emerald ash borer (EAB) in cooperation with the USFS has recently been initiated because this exotic pest from Asia has the potential to become a serious threat to urban and rural forests in Ohio. The EAB was first detected in 2002 in southeastern Michigan and has since been found throughout Ohio. Since its discovery in 2002, this insect has killed tens of millions of ash trees (*Fraxinus* spp.) in Michigan. It is a strong flyer and can spread on its own but has become rather widespread due to being transported in ash firewood, logs and nursery stock. The USFS began monitoring for the EAB at Camp Ravenna in 2004. It is now assumed to be present at Camp Ravenna and no longer specifically monitored.

The EAB belongs to a group of insects known as metallic wood-boring beetles. This pest is a slender, elongated, bright green beetle. Adults are observed from mid-May until late July. Larvae are creamy white in color. The ash borer affects white, green, black, pumpkin, and several horticultural varieties of ashes whether healthy or stressed. The female beetle deposits eggs on the bark. Larvae hatch in 7 to 10 days and chew through the bark to the cambium layer and feed on the phloem and outer sapwood completely girdling the host tree. It's difficult to detect EAB when it first infests a tree. The tree foliage usually wilts and the canopy becomes thin as branches die. The emerging adults leave a tell tale D shape exit hole in the bark of trees. The bark may split at these exit holes and when peeled back frass filled S shaped feeding galleries are revealed. Epicormic shoots may also develop on the trunks of infested trees and trees may sprout profusely when cut. Trees show signs of crown die-back usually by the second year of infestation and death usually occurs within 3 to 4 years. There are no known biological, cultural, or chemical controls at this time (USFS, 2004; Ohio Department of Agriculture, 2006).

6.8.8.3 BUTTERNUT CANKER MANAGEMENT

Another forest health problem of note is butternut canker. The disease is caused by a fungus known as *Sirococcus clavigignenti-juglandacearum* that girdles branches and the main trunk resulting in the death of the tree. It is under observation for Federal listing by the USFWS. The fungus causing disease girdles branches and the main trunk, resulting in the death of the tree. Insects are suspected to have caused the recent rapid and far-reaching spread of the disease. There are currently no known controls. Efforts are focused on finding resistant individuals (USFS, 1996). At Camp Ravenna, butternut is not harvested. The USFS and Ohio Division of Forestry (ODOF) will be notified if healthy trees are found, so that the trees can be evaluated for possible resistance to the canker.

6.8.8.4 BEECH BARK DISEASE MANAGEMENT

Beech bark disease (BBD) is a fungus which attacks and most often kills American beech (*Fagus grandifolia*), a species extremely abundant throughout Camp Ravenna. BBD is caused by an interaction between a European fungus which is spread by a native beech scale insect indigenous to several of Ohio's northeastern-most counties. Infection occurs when spores enter the host tree through wounds created by the scale insect. While the disease carrying beetle was first detected at the Holden Arboretum in 1985, BBD was not confirmed in Ohio until 2003 when the exotic fungus was found and identified at the Holden Arboretum. To date, no infested trees or suspect trees have been found at Camp Ravenna. Because of the proximity of Camp Ravenna to areas with known infestations in Northwest Pennsylvania, periodic monitoring of trees at the installation will be conducted by in-house staff. Should BBD be found on any beech trees at Camp Ravenna, the Ohio Department of Agriculture and the Ohio Division of Forestry will be immediately notified. In the event that beech trees on the installation become diseased or subject to Federal and/or state quarantine regulations, The Camp Ravenna Environmental staff will take appropriate action to comply with all laws while at the same time best managing the resource to enhance the overall health and productivity of the forest. To date, there are no known biological control methods for BBD. However, according to the US Forest Service, one-five percent of our native beech trees have inherent resistance to this disease.

6.8.8.5 THOUSAND-CANKERS DISEASE MANAGEMENT

Thousand cankers disease (TCD) is a pathogen which attacks black walnut (*Juglans nigra*) trees, a species present though not particularly abundant at Camp Ravenna. TCD is the result of the combined activity of a fungus and the walnut twig beetle which carries the pathogen on its body and inoculates the host tree when it is bored into (www.thousandcankers.com, 2012). In May 2012, the Ohio Department of Agriculture issued a quarantine preventing the introduction of out-of-state walnut material into Ohio. Exceptions include (debarked) processed lumber, nuts and nutmeats. Later in the year, TCD was discovered at a wood processing facility in Butler County in southwestern Ohio. Although not as contagious as Dutch Elm Disease (which is a disease spread by a bark beetle), a diseased walnut tree can die within eight – ten years from repeated infections (Ohio Department of Agriculture, May 2012). Signs of TCD include sudden yellowing or wilting of leaves, branch dieback and crown thinning. Regular monitoring of the walnut trees throughout Camp Ravenna will be an ongoing effort done by the Natural Resources Manager. Should any walnut trees at Camp Ravenna be found showing signs or symptoms of TCD, the appropriate agencies, including the Ohio Department of Agriculture and the Ohio Division of Forestry, will be notified and management actions will be conducted in a way that enhances the overall healthy and quality of the woodlands at Camp Ravenna.

6.8.8.6 ASIAN LONGHORN BEETLE (*ANOPLOPHORA GLABRIPENNIS*) MANAGEMENT

The Asian longhorn beetle (ALB) is an exotic pest introduced from China which attacks many species of hardwood trees, especially maple (*Acer* sp.). Other species known to be infested with ALB which are also present at Camp Ravenna includes willow, elm, sycamore, ash and "poplar". This insect was first discovered in Clermont County, Ohio, in 2011. ALB is an insect of particular concern because maple is one of the dominant species throughout Camp Ravenna. After mating in the spring, females lay their eggs in rough pits created just under the bark. After the eggs hatch, the larvae begin boring rather large holes up to 3/8-inch wide in the branches and trunk from which they emerge as adult beetles after spending nearly the first nine months of their lives inside the host tree. Mortality from ALB infestations typically results from large trees becoming structurally unstable and subject to wind-throw due to the many large holes throughout. Because this beetle spends so much of its life inside the host maple tree, it is nearly impossible to control with insecticides. Adult beetles can fly up to 400 yards yet typically do not stray far from the host tree which is primarily why "hot spot" eradication efforts are typically successful when detected early (Ohio Division of Forestry, 2011). Regular monitoring of the maple trees throughout Camp Ravenna will be an ongoing effort done by the Natural Resources Manager. Should any maple trees show any signs or symptoms of ALB, the appropriate agencies will

be immediately notified and management actions will be taken to ensure the overall health and quality of forest lands throughout the installation.

6.8.8.7 HEMLOCK WOOLLY ADELGID (*ADELGES TSUGAE*) MANAGEMENT

The hemlock woolly adelgid (HWA) was discovered in Ohio in 2012 in Meigs and Washington Counties located along the Ohio River in southeastern Ohio. The HWA is an exotic pest introduced from Asia which attacks and kills eastern hemlock (*Tsuga canadensis*), an evergreen forest tree species found at Camp Ravenna in Wadsworth Glenn – a recognized special interest area. The HWA is a small, aphid-like insect that kills its host species (hemlock) by extracting fluids out of the needles which causes them to desiccate and fall off. Depending on the size of the tree and infestation, mortality usually occurs within four years. HWA is a unique pest in that it completes two life cycles per year. To date, there are no practical or widely-used biological control methods to prevent the continued spread of HWA. In Northeast Ohio, average winter temperatures are currently severe enough to prevent any hot-spot infestations that may be introduced into the area from becoming widespread infestations. In 2001, an infestation was found on several young trees planted in a residential yard in Lake County, Ohio. Subsequent monitoring conducted in this area by the Ohio Department of Agriculture has confirmed no further spread of HWA into nearby forested areas where eastern hemlock is present. Though eastern hemlock makes up a rather insignificant component of the flora at Camp Ravenna, periodic monitoring of the native trees in Wadsworth Glenn will be conducted by the Natural Resources Manager. Should any hemlock trees begin showing signs of HWA infestation, the Ohio Department of Agriculture and the Ohio Division of Forestry will be immediately notified.

6.8.9 SPECIAL FOREST MANAGEMENT CONSIDERATIONS

6.8.9.1 RIPARIAN ZONES

Riparian zones will be defined as the area directly around "blue line" streams on USGS 7.5-minute topographic maps. The following guidelines will be adhered to when conducting forest management operations in riparian areas:

- Buffer zones will be established around riparian areas of 50 feet for 0 percent slope, 95 feet for up to 10 percent slope, and 130 feet for up to 20 percent slope.
- Main skid trails will not be permitted within established buffer zones.
- Drainageways, creeks and streams will be crossed at right angles using culverts and/or bridging.
- Only single tree selective harvesting will be used within established buffer zones.
- Trees with exfoliating or loose bark will be retained whenever possible.
- Standing dead trees will be retained whenever possible.
- Slash and logging debris six inches or greater in diameter will not be left in drainage channels.
- Adequate canopy cover will be maintained to retain shade on creeks, streams, and drainage ways unless incompatible with approved construction needed for mission support.

6.8.9.2 HEADWATER AND WETLAND AREAS

Headwater areas are those drainage areas, water seeps, and springs that may or may not be identified on USGS 7.5-minute topography maps but are present in the field and are the upper reaches of a drainage area. The drainageways are usually dry for part of the year and usually are mapped on the NRCS County Soils Inventory Maps. Water seeps and springs are usually wet year round. Wetlands are those areas that qualify under the USACE current definition of jurisdictional wetlands or those areas that are classified as isolated wetlands and regulated by the OEPA. Some of these areas are mapped on the Camp Ravenna wetland map, but many are not. Field identification by the Camp Ravenna Environmental Office and/or contracted jurisdictional delineation is needed to identify wetland

locations. The following guidelines will be adhered to when conducting forest management operations within headwaters and wetland areas:

- Identify headwater and wetland areas within the area of operation.
- Designate traffic routes and drainageway crossing locations/procedure to avoid damage to draingeways.
- Set up a no traffic buffer zone around springs and water seeps.
- Set up a no traffic buffer zone around non-forested wetlands.
- Minimize the number of skid trails within forested wetlands and locate main skid trails on the highest ground possible.
- As much as possible, minimize heavy equipment use within forested wetlands when the ground is saturated.
- Avoid felling of timber and leaving tops in vernal pools and other wet areas within harvest areas.
- Keep logging debris out of non-forested wetlands, water seeps, and springs.
- Level ruts and restore any disturbed ground to original grade.

6.8.9.3 RARE SPECIES, MIGRATORY BIRDS AND UNIQUE HABITATS

There are no federally listed endangered, threatened, or candidate species or critical habitat at Camp Ravenna. The Northern long-eared bat is proposed for federal listing in 2015. It is present on Camp Ravenna and will require special management emphasis if it is listed. Procedures and restrictions on timber management operation and other activities at Camp Ravenna to facilitate management of the Northern long-eared bat are contained in **Appendix J**. Camp Ravenna is within the range of the Indiana bat, which is also a federally listed endangered species. The Indiana bat has not been found on Camp Ravenna but since habitat exisit on Camp Ravenna and the Indiana bat has been documented in NE Ohio it could be potentially impacted by the Camp Ravenna timber management program. Several bat surveys have been conducted at Camp Ravenna (Tawse, 1999; Davey Resource Group, 2002; Duffey & Brack, 2005; Tragus, 2010). Netting efforts have provided no evidence of Indiana bats. Based on the scattered habitat it is very difficult to conduct effective Indiana Bat surveys at Camp Ravenna within the limits of specific timber sale boundaries. One survey was conducted on this basis, however, an area conducive for sampling could not be found within the harvest area and mist nets had to be set up in areas outside the harvest area. Because of this issue, discussions were held with the USFWS. It was agreed that a Camp Ravenna-wide survey focusing on the best habitat areas would be more beneficial than sampling small areas every time a timber sale was proposed. Due to the fact that large surveys are expensive and past surveys have not detected the Indiana bat, it was agreed that doing Camp Ravenna-wide bat surveys every five years would be sufficient for determining the presence of the bat at Camp Ravenna. With the known presense of the Northern long-eared bat, the frequency and need for bat surveys will be reviewed with the next INRMP update.

Because the Indiana bat has not been found at Camp Ravenna there has historically been no mandatory restriction on when trees can be cut. Even so, as a way to protect bats that may have gone undetected, the USFWS recommended time restrictions on tree cutting are followed when possible, particularly in the areas considered as high quality bat habitat. The disadvantage of not allowing felling during the summer months is that it forces logging to be done during the time of year when the forest soils are saturated. Logging in wet soil conditions can be very destructive to the long term sustainability of the forest ecosystem. Some of the soil impacts can be mitigated by felling prior to 1 April and after 30 September and waiting until the soil is dry to skid the logs. This method can be used as long as there are not a lot trees on the ground and they are not down so long that they stain or otherwise spoil. Another method used to avoid potential impacts to the Indiana bat is to log when the ground is frozen. This is a good method when winter is cold enough and the snow cover is light enough to provide a

solid freeze. In the absence of a solid freeze, most soil in the winter is saturated and very easily damaged by logging operations. Now that the Northern long-eared bat is proposed for federal listing in 2015, restrictions must be implemented on when trees three (3) inches in diameter and greater can be felled. Trees cannot be felled between 1 April and 30 September. Further evaluation of logging operation and other restrictions due to the Northern long-eared bat are included in **Appendix J**. These restrictions also serve to protect the Indiana bat. Migratory birds protected under the Migratory Bird Treaty Act, local migratory birds, and non-migratory birds require special consideration when harvesting timber at Camp Ravenna. Camp Ravenna is a home or migratory stop for over 214 species of birds. Several of these species have been identified or listed by various conservation agencies and organizations as species of concern (see Section 4.4.1). The overall abundance and diversity of bird species at Camp Ravenna is indicative of the quality and availability of habitat and the intent of the forest management program is to perpetuate this habitat. It is believed that because Camp Ravenna has a large amount of forested acreage and that selective harvesting is used over relatively small areas at any given time being careful to avoid cutting active den and nest trees, that timber harvesting has not negatively impacted bird populations even when cutting is done during the breeding season. Because of the demonstrated lack of impact to bird diversity and the wet soil issues discussed above, there is no firm restriction on harvesting at Camp Ravenna during the breeding season. However, because of potential impacts to federally listed bats during their brood season, tree felling will be avoided between 1 April and 30 September. Loggers will be required to fell timber outside of these dates and harvesting suspended if found to be negatively impacting wildlife or site conditions.

The following guidelines will be used to ensure forest management operations do not negatively impact rare species, birds, and/or unique habitat areas:

- Consult biological inventories and this plan in the planning stage of projects and forest management operations to ensure rare species and unique habitats are identified and special needs considered.
- Whenever possible, avoid felling timber between 1 April and 30 September to minimize impacts to possible roosting bats (especially in quality bat habitat areas) and forest nesting birds.
- Conduct annual breeding bird route surveys to determine trends and changes in bird species composition.
- Complete training site wide bird planning level survey every ten years.

6.8.9.4 GENERAL WILDLIFE CONSIDERATIONS

The following guidelines regarding wildlife will be followed at Camp Ravenna:

- A minimum of two den trees per acre will be retained during all timber harvests.
- Standing dead trees will be retained unless they are a safety risk to personnel.
- Cull trees with active dens that must be deadened to meet ecosystem objectives will be killed by girdling so they die slowly over time and retain their utility as den trees.
- Soft and hard mast producing trees will be favored for release in areas where they are scarce.
- Active den and nest trees will not be cut during timber harvesting unless required for a military readiness project.
- A diversity of habitat structure and type will be maintained throughout Camp Ravenna.

6.8.10 COOPERATIVE MANAGEMENT PROGRAMS

Camp Ravenna cooperates with federal and state forestry agencies and forest industry organizations to further research, education, and the practice of responsible and sustainable forest management. In the past the USFS has conducted crop tree management research and assisted in insect and disease

monitoring and management. The USFS assistance in forest insect and disease management is discussed in that section of this plan. Forest landowner educational field days and professional forestry tours and presentations are also occasionally held at Camp Ravenna.

The ODOF currently has no active research programs in place at Camp Ravenna, but they are a source of technical expertise. Several of the ODOF foresters have been given tours of the installation and the Camp Ravenna Environmental Supervisor has a good working relationship with the area foresters. Cooperation with the ODOF will continue and expand as mutually beneficial to both organizations.

The Ohio Forestry Association (OFA) is approved to conduct chainsaw safety training, skidder operation training, and BMP training at Camp Ravenna. This training is coordinated with military training and forest management needs and ongoing timber management operations.

The OHARNG will continue to foster these and other mutually beneficial research and educational opportunities that are compatible with the military mission and the methodologies of this plan.

6.8.11 FOREST MANAGEMENT RECORDS

The Camp Ravenna Environmental keeps all forest management records. Complete files are kept on timber sales including the ROAs and completion reports. Income summaries from sawtimber sales are provided by the USACE and are kept in a file. Minor forest products sale files and recorders are also kept by the Camp Ravenna Environmental Office. Some of the historical management information is kept on marked-up, colored maps. GIS data layers are developed and used as time and funding permits.

6.9 GRASSLAND, OLD FIELD, AND SUCCESIONAL FOREST MANAGEMENT

Grasslands are those areas with grasses as the dominant vegetation type. Grasslands at Camp Ravenna are mostly the result of old agricultural fields that have been mowed or burned to support training or specifically to maintain the grassland. The majority of the grasslands are made up of a mixture of cool season and warm season grass and forbs. Woody plants usually make up less than 10 percent and forbs make up less than 50 percent of the plant cover. Old field habitat is more abundant than grasslands at Camp Ravenna. Some of the old fields are in bottomlands with the dominant vegetation consisting of sedges, rushes, and reed canary grass and are considered to be bottomland or wet meadows. Other old fields are on uplands. Those with vegetation consisting of 50 percent or more forbs and less than 10 percent woody shrubs are considered upland meadows. Meadows that develop a woody plant component greater than 10 percent are considered to be in the shrub stage. Most of the old fields at Camp Ravenna are advanced in woody shrub and tree sapling growth. Successional young forest habitat is another very valuable habitat type. The USFWS, in cooperation with the Wildlife Management Institute (WMI), initiated a Young Forest Habitat Initiative with the goal of increasing and maintaining dense young forest habitat. Many of the old fields at Camp Ravenna are currently in the young forest stage but the forest is maturing and the lack of clear cutting does not help perpetuate young forest habitat. To augment habitat diversity in light of the Camp Ravenna main forest management goal to maintain large blocks of closed canopy forest, the OHARNG has partnered with the WMI and designated 128 acres in several areas and treated them to establish and maintain young forest habitat.

The natural tendancy for grasslands and old fields at Camp Ravenna is for them to revert to forest. A Large portion of them have already done so. The dense shrub habitat of reverting old farm fields is abumdant at Camp Ravenna. Open fields and grassland habitat is more limited. These habitat types are of value to certain species of wildlife and particularly to grassland nesting and feeding birds, certain mammals, reptiles, and insects. Maintaining open grasslands is desirable for retaining and improving biological diversity. Grassland management is of particular importance in conjunction with wetland management to provide nesting cover for certain waterfowl. Woody vegetation will be set back in identified grassland areas using a combination early spring of fall controlled burning, herbicide application, or mowing before 15 April or after 15 August. Herbaceous cover will be established and maintained by mowing, discing, or burning every two or three years. Areas will be reseeded, when possible, with native seed mixes identified in **Section 6.5.3.1** or other appropriate native prairie seed

mixes. When designating areas to be maintained as grassland and open fields consideration will be given to areas that will best support the training mission and benefit wildlife.

Figure 15 illustrates both grassland and young forest habitat areas at Camp Ravenna. Primary grasslands are grasslands where vegetation control / management can be done outside of the nesting season and training use of the area is mostly compatible with grassland management objectives. Secondary grasslands are grassland areas where mission needs do not allow for vegetation control / management to always be conducted outside of the nesting season. These areas generally receive heavy training usage and habitat management is not a primary consideration. Young forest habitat areas generally late stage old field reversions adjacent to mature forests. The vegetation is cut back to allow dense hardwood tree regeneration. Treatments are done every 5 to 10 years.

Transition zones, or the "edge," between grassland and forest are also important to manage. Ideally, the transition zone should not be abrupt, but should contain an area in intermediate stages of conversion between field and mature forest. Edges also provide valuable cover for military training. Existing natural edges will be retained and enhanced, wherever possible, to improve areas for training and wildlife habitat.

6.10 FIRE MANAGEMENT

6.10.1 FIRE PROTECTION

There is no fire department at Camp Ravenna. Fire protection is provided by local volunteer and city fire departments. Camp Ravenna has no fire fighting capability. The basic fire fighting procedure for a fire in active explosive storage areas is to get back and let the fire burn itself out and contain it from spreading to other areas where possible. In non-explosive areas, normal suppression procedures are used.

There are active water hydrants on the installation in the TTB and Cantonment Area 3. Water for fire fighting in other areas must come from surface impoundments throughout the installation or from a tanker truck.

Fire protection is aided by the network of roads, railroads, power lines, and sewer lines throughout the installation. These rights of way serve as firebreaks. Most of the power lines and all of the sewer lines have been abandoned and will diminish in utility as firebreaks as time passes. Another aid in fire protection is the type of hardwood forests at the installation. Most of the forests are wet to moist year round. Generally, the forest types are not fire dependent and do not have a history of burning.

6.10.2 CONTROLLED/PRESCRIBED BURNING

No regularly scheduled prescribed burning occurs at Camp Ravenna. Controlled burning is used from time to time for grassland management and as training for military units. Burning will also be used to maintain grassland on the MPMG/MK-19 Range and other ranges as they are constructed. When possible, controlled burns are conducted as joint training missions with the Ravenna City Fire Department and other local fire departments. All prescribed or controlled burns will be conducted in accordance with current DoD and Army policies covering burning on military lands and the updated OHARNG Integrated Wildland Fire Management Plan.

Those areas being managed as grasslands, old fields, ranges, and for desirable forest regeneration are eligible for burning. Sites identified for burning are reviewed for the presence of rare species or existing cultural resource sites prior to burning. The burns are timed just before green-up when the fuel moisture content is conducive to burning and prior to the nesting season or in the fall after nesting season when the fuel is plentiful and dry. The Camp Ravenna Environmental Office is responsible for obtaining the necessary OEPA open burning permit and for administering controlled burning operations.

6.10.2.1 GRASSLANDS

Historically grasslands have been maintained at Camp Ravenna by mowing. Controlled burning is a valuable management technique for maintaining grassland habitat. However, prescribed burning can also devastate certain Lepidoptera populations that use grasslands as overwintering and breeding areas. Also, some of the grasslands at Camp Ravenna are not dense enough to sustain a fire. For these reasons, large scale controlled burning operations will not be conducted at Camp Ravenna. When burns are conducted, only a portion of the managed grassland acreage will be burned during one season.

6.10.2.2 FORESTS

Controlled burning has not been used as a silvicultural tool in the past at Camp Ravenna, but it will not be ruled out as a tool for controlling unwanted understory vegetation and for regenerating oak stands. If it is determined that there is not adequate oak regeneration in timber management areas due to vegetative competition, controlled burning will be considered. However, this method will not be widely used because the primary forest type on the installation is Beech-Maple, which does not benefit from burning. Burning will be used in oak forests and in other forest types where oak regeneration is desirable to retain species diversity. USFWS guidelines regarding the Northern long-eared bat will be followed when burning.

There is no need at Camp Ravenna to conduct controlled burns in order to reduce fuelwood build-up. The hardwood debris from natural forest processes and timber harvesting is mostly large and scattered and decays fairly quickly and does not create a fire hazard. There are no pine forests on the installation that create a fire hazard. Also, logging slash and other downed material is available for firewood sale, which helps to reduce forest floor fuel build up.

6.11 AGRICULTURAL OUTLEASING

No future plans for agricultural outleasing at Camp Ravenna exist, however the site was used historically for agricultural purposes. The majority of the installation acreage was in agricultural production at the time of government purchase. The exact history of agricultural use after government purchase is not known. Many of the fields were leased for the production of row crops, forage, and hay. Records are not available, but it is believed that leasing began in the 1940's during the construction of the installation and occurred up until the early 1970's. Grazing leases for cattle and horses were started sometime in the late 1950's or 1960's. All agricultural leases were stopped when the RVAAP mobilized for the Vietnam War.

In the 1980's the RVAAP Command pushed to get the agricultural program established again. The local Soil and Water Conservation Service developed a plan to establish row crops and hay production. A contractor was hired to clear brush and return Tract 1 into a hay field. The field was first leased in 1986. Several other fields were advertised for lease; however, there was no local interest. Also in 1986 a 60-acre sugarbush (Tract 2) was leased for the collection of maple sap. Both Tracts were leased for three, five-year periods and not renewed for a forth five year period. The old hay field is now used as a tactical vehicle maneuver area and to support engineer training.

6.12 INTEGRATED PEST MANAGEMENT PROGRAM

The OHARNG completed the statewide IPMP 25 May 2005. This Plan describes the OHARNG's pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. No specific IPMP for the Camp Ravenna facility has been developed. Camp Ravenna personnel are required to use the statewide plan.

The plan outlines a list of pests that are of concern on OHARNG installations and how they should be managed. OHARNG pests include, but are not limited to, rodents, groundhogs, woody vegetation, invasive plants, and insects. The Camp Ravenna Daily Pest Control Report is completed daily as applications are conducted. Copies of the IPM plan and pest control reports are available on the OHARNG Environmental website and in the Camp Ravenna Environmental Office, respectively. Laws and regulations pertaining to invasive and exotic species and pest control include the following, which are described in **Appendix E**.

- Federal Noxious Weed Act of 1974 (7 USC §2801 et seq.);
- Federal Insecticide, Fungicide, and Rodenticide Act (7 USC §136);
- Federal Pest Plant Act (7 USC §150a et seq.);
- EO 12865, Reduction of Pesticide Application by 50% by Fiscal Year (FY) 2000;
- EO 13112, Invasive Species;
- National Aquatic Invasive Species Act of 2003 (NAISA);
- ORC §921, Pesticides; and
- OAC 901:5-37-01, Prohibited noxious weeds.

6.12.1 PEST MANAGEMENT COORDINATOR

The Camp Ravenna Environmental Supervisor, Mr. Timothy Morgan, is the Camp Ravenna Pest Management Coordinator (PMC). Mr. Morgan is State of Ohio certified and licensed to apply pesticides. The PMC is responsible for overall program administration, oversight, quality assurance, scope of work reviews, record keeping, and reporting. Pest management files are kept in the Camp Ravenna Environmental Office.

6.12.2 CERTIFICATION OF PESTICIDE APPLICATORS

In accordance with DoD Policy, all pest management personnel who apply pesticides at Camp Ravenna shall be either DoD or State certified and licensed to apply pesticides in the applicable category. Uncertified personnel may not apply pesticides, even if supervised by a certified individual. The DoD certified applicator policy does not differentiate between restricted use and non-restricted use pesticides. Certification is required to apply either type.

6.12.3 CHEMICAL CONTROL OF VEGETATION (HERBICIDE USE)

It is the policy of the OHARNG to minimize the use of all pesticides, including herbicides, at the installation. Whenever possible the OHARNG will use those families of pesticides that degrade rapidly in the environment in order to minimize the potential for soil and water contamination. Herbicides are currently used annually to spot treat under the perimeter fence fabric and the fence clear zone (27 miles of fence), to spot treat under the east barbed wire fence and the fence clear zone (6 miles), to spot treat mowing obstructions along active roadsides (approximately 110 miles), to control woody vegetation in ditches, to control vegetation in parking lots, to control woody vegetation under powerlines, to control woody vegetation on training site assets, to manage invasive and noxious plants, and to manage aquatic vegetation. Woody vegetation growing along the sides of active buildings is spot treated as necessary. Active railroad tracks (12 miles) are also treated as necessary to keep the tracks and ditches free of woody brush.

Herbicides are used to control unwanted vegetation in areas where mechanical mowing is difficult or not cost effective. A wide range of USEPA-registered herbicides are available for use at Camp Ravenna. The herbicides used include those that are the least persistent and most non-leaching, which will provide the desired control. Only those herbicides pre-approved by the Camp Ravenna Environmental Office and in the OHARNG Installation Pest Management Plan may be used.

Herbicides are used to conduct Timber Stand Improvement (TSI) and to control invasive plants and noxious weeds.

Aquatic weed control, where necessary, is done by Camp Ravenna or subcontracted. Treatment is done to control non-native invading species, and to control weeds in designated fishing ponds. The ODOW is available for technical support. Aquatic herbicise applications must be conducted in accordance with the applicable Ohio EPA General NPDES Permit.

6.12.4 INVASIVE PLANT SPECIES AND NOXIOUS WEED MANAGEMENT

Several plant species were designated prohibited noxious weeds in the State of Ohio under OAC 901:5-37-01, *Prohibited noxious weeds*, 25 February 2013. The 18 species designated include: apple of Peru (*Nicandra physalodes*), Canada thistle (*Cirsium arvense*), cressleaf groundsel (*Senecio glabellus*), giant hogweed (*Heracleum mantegazzianum*), Johnsongrass (*Sorghum halepense*), marestail (*Conyza canadensis*) [also known as Canadian horseweed], mile-a-minute weed (*Polygonum perfoliatum*), musk thistle (*Carduus nutans*), oxeye daisy (*Chrysanthermum leucanthemum* var. *pinnatifidum*), poison hemlock (*Conium maculatum*), purple loosestrife (*Lythrum salicaria*), Russian thistle (*Salsola kali* var. *tenuifolia*), shatter cane (*Sorghum bicolor*), wild carrot (*Daucus carota*) [also known as Queen Anne's Lace], wild mustard (*Brassica kaber* var. *pinnatifida*), wild parsnip (*Pastinance sativa*), Japanese knotweed (*Polygonum cuspidatum*), and grapevines (*Vitis* sp.) when growing in groups of one hundred or more that have not been pruned, sprayed, cultivated, or otherwise maintained for two consecutive years.

There are no federally listed noxious weeds at Camp Ravenna that require control. There are seven species of state listed noxious weeds. The State noxious weed law requires control of these species only if a complaint is filed to a Township Trustee and Camp Ravenna is then notified by the Township to initiate control. EO 13112, *Invasive Species*, requires the federal agencies to control exotic species on federal land. The control of non-native and invasive plants is needed to maintain ecosystem health and sustainable training land.

There are several invasive and/or non-native species that are prevalent in old fields and wetlands at Camp Ravenna. These plants can negatively impact the ability of the land to support dismounted training. They can also negatively impact natural succession of native plant assemblages and wildlife habitat. When damaging populations of non-native and/or invasive species are discovered, control efforts are programmed and funding requested. Controls may include mechanical removal, controlled burning, use of herbicides, and biological controls. The primary species of concern at Camp Ravenna at this time are tree-of-heaven (*Ailanthus altissima*), purple loosestrife, multiflora rose, glossybuckthorn (*Frangula alnus*), Russian olive (*Elaeagnus angustifolia*), and autumn olive (*Elaeagnus umbellata*).

6.12.5 OTHER PESTS

Forest pest management is discussed in **Section 6.8.8.** There are no forest insects or disease pest control needs at this time at Camp Ravenna beyond vegetation management via TSI. The determination as to the need for future control efforts will be done jointly with NGB, the USFS and the Ohio Department of Agriculture.

Wasps and bees are problem pests primarily to personnel checking locks in munitions storage areas and other buildings throughout Camp Ravenna. Pre-approved chemicals to control these pests are included in the IPM plan and are issued to personnel as needed. The quantity of insecticide issued is reported to the PMC for recording and reporting.

Occasionally an ant or spider problem arises in one or more of the three active buildings. In these instances, contractors are hired to control the pests. Contractor pesticides and mode of control are reviewed by the Camp Ravenna PMC prior to application. Attempts are made to identify and eliminate the nesting, breeding, and feeding areas of reoccurring problems.

Mice have historically been a problem at Camp Ravenna. The best control method is exclusion of the mice from structures. When this can not be done, the mice are controlled by trapping or baiting. Baiting requires rotating rodenticides to avoid developing immunity. One dose baits are used whenever possible. Frequent monitoring of bait stations is also required to avoid outbreaks of a secondary pest invader, the spider mite beetle. This beetle feeds on the old rodent bait then uses the cardboard in the explosives containers as breeding sites. When beetles are observed, the old bait is removed and more frequent bait checks are done.

Ground hogs have also historically been a problem to ECM's through their digging burrows into the earth cover. Fumigants, trapping, and shooting have historically been used to control ground hogs.

Control has not been needed for several years. It is believed that the coyote population is keeping the ground hogs in check.

Nuisance wildlife includes feral cats, beavers, and raccoons at Camp Ravenna. Invasive wildlife pest management is discussed in greater detail in **Section 6.3.5**.

6.13 OUTDOOR RECREATION

Camp Ravenna is a military installation and not an outdoor recreation area. Outdoor recreational opportunities are available, but secondary to the primary mission of military training and in accordance with the ability of the Camp Ravenna staff to administer such access. The OHARNG is committed to protecting and enhancing environmental quality, conserving natural resources, and providing opportunities for outdoor recreation when compatible with the military mission. The ODOW partners with Camp Ravenna to provide wildlife related outdoor recreational opportunities. Current outdoor recreational programs include hunting, fishing, trapping, and Watchable Wildlife (flora and fauna tours). Occasionally, a Boy Scout troop, military unit, or other organization is authorized to have a picnic and day of fishing at Cobb's Pond or other special field day event such as a youth forestry day.

Laws and regulations pertaining to outdoor recreation include the following, which are described in **Appendix E**.

- SAIA (16 U.S.C 670 *et seq*.);
- EO 12960, Recreational Fisheries;
- ORC § 1533, Fish and Hunting;
- OAC 1501:31-13-01,-02,-15, Sport fishing, Migratory game birds, and hunting and trapping; and
- Camp Ravenna Joint Military Training Center Regulation 200-3, Hunting, Fishing, and Trapping.

Each program and the roles of the OHARNG and the ODOW are described in greater detail below.

6.13.1 WHITE TAILED DEER HUNTING

Deer hunts are held each year at Camp Ravenna. The hunts are administered through a cooperative effort between the OHARNG and the ODOW. The shotgun hunts are open to the general public through a lottery type drawing done by the ODOW. A limited number of hunting slots are reserved for military personnel (active duty, reserve component, retired). The number and type of hunt (50/50 buck/doe or antlerless only) needed to meet the deer herd management objectives varies each year based upon the size of the herd and male to female sex ratio. Bow hunting is available only to Camp Ravenna employees and permanently assigned military personnel. Eligible participants are permitted to escort and hunt with a guest. Guest must be U.S. citizens and may be from the general public. Bow hunting is not permitted during shotgun hunt days. A hunt area map is included as **Figure 16**.

Each year in February the Camp Ravenna ENV Office requests the training schedule for the coming October, November and December from Camp Ravenna Range Control. The ENV Office determines the necessary hunt days and schedules them on Saturdays not reserved for training. The hunt days are presented to the ODOW for approval at an annual INRMP review meeting usually held in March.

Each deer hunter is charged an administration fee as shown below.

- Shotgun Deer Hunting: All participants will be charged $5.00.
- Bow Deer Hunting: All participants will be charged $5.00.

The roles of each agency specific to the administration of deer hunting are listed below.

The OHARNG will:

- Authorize deer hunting and public access to Camp Ravenna in accordance with security requirements;
- Determine program objectives, goals, and management strategies;
- Develop Camp Ravenna regulations, policies, and procedures necessary to facilitate the deer hunt;
- Provide the ODOW with program information, letter permit language, and other necessary administrative information;
- Provide a building for registering hunters and checking deer;
- Provide restroom facilities for the hunters;
- Provide traffic signs to direct hunters to their areas;
- Administer military deer hunt permits;
- Administer the bow hunting program;
- Administer the Volunteer Escort (VE) program;
- Administer mobility impared hunter access;
- Provide all administrative and logistic support on hunt days; and
- Provide the ODOW with other support as required.

The ODOW will:

- Solicit hunt applications from the general public;
- Select participants from the general public in an unbiased fashion;
- Provide Camp Ravenna with an electronic roster of successful applicants at least two weeks before the scheduled hunt date;
- Provide all necessary copies of Camp Ravenna program information, maps, hunter certification statements, parking passes, permits, etc. to successful applicants; and
- Provide at least one employee to manage the deer tagging station during deer hunts.

6.13.2 WATERFOWL HUNTING

As mission activity permits limited waterfowl hunting is permitted at Camp Ravenna during the waterfowl hunting season. Waterfowl hunting is open to those permitted unescorted access to Camp Ravenna (Camp Ravenna employees and assigned military) and up to 3 escorted guests (general public). The Camp Ravenna Environmental Office administers the program.

Hunt availability is determined each year by the OHARNG. The hunting season and bag limits are in accordance with federal and state hunting regulations. Hunting is permitted on days that do not conflict with mission activities. Available hunting areas are designated based on mission activities and water conditions. Each waterfowl hunting permit holder is charged a one-time annual administration fee of $5.00.

The roles of each agency in administering waterfowl hunting at Camp Ravenna are listed below.

The OHARNG will:

- Authorize waterfowl hunting at Camp Ravenna in accordance with security requirements and allow for escorted public access;

- Administer the program, designate hunting areas, provide for hunter sign in and out, and keep records of game taken;
- Develop Camp Ravenna regulations, policies, and procedures necessary to facilitate waterfowl hunting;

The ODOW will:

- Provide law enforcement oversight and support as necessary.

6.13.3 TURKEY HUNTING

Turkey hunting is permitted at Camp Ravenna during both fall and spring turkey seasons. Fall hunting is open to deer bow hunters in accordance with state regulations and others who acquire a Camp Ravenna Turkey Hunting permit. Spring gobbler hunting is open to to those permitted unescorted access to Camp Ravenna (Camp Ravenna employees and assigned military) and up to 3 guests (general public). A limited number of controlled access public youth turkey hunts are also available. The Camp Ravenna Environmental Office administers the programs. The public youth hunters are selected by the ODOW.

Hunt availability is determined each year by the OHARNG. The hunt dates are in accordance with state hunting regulations and subject to modification to avoid conflict with mission activities. Each turkey hunting party with the exception of youth hunters is charged a one-time annual administration fee of $5.00.

The roles of each agency in administering turkey hunting at Camp Ravenna are listed below.

The OHARNG will:

- Authorize turkey hunting at Camp Ravenna in accordance with security requirements and allow for escorted public access and controlled youth access;
- Administer the program, designate hunting areas, provide for hunter sign in and out, and keep records of turkey taken;
- Develop Camp Ravenna regulations, policies, and procedures necessary to facilitate turkey hunting;
- Provide the ODOW with program information, letter permit language, hunt area maps, and other necessary administrative information;
- Conduct the security and hunt rules briefing for youth hunts; and
- Provide the ODOW with other support as required.

The ODOW will:

- Solicit hunt applications from the general public for youth hunts;
- Select youth hunt participants from the general public in an unbiased fashion;
- Provide Camp Ravenna with an electronic roster of successful applicants at least two weeks before the scheduled hunt date (electronic data base preferred);
- Provide all necessary copies of Camp Ravenna program information, maps, hunter certification statements, parking passes, etc. and mail them to successful applicants with their letter permit; and
- Assist the OHARNG with youth hunter oversight when possible.

6.13.4 SMALL GAME HUNTING

As mission activity permits, limited small game hunting is permitted at Camp Ravenna during the fall/winter hunting season. Small game hunting is open to those permitted unescorted access to Camp

Ravenna (Camp Ravenna employees and assigned military) and up to three guests (general public). The Camp Ravenna Environmental Office administers the programs.

Hunt availability is determined each year by the OHARNG. The hunt dates and bag limits are in accordance with state hunting regulations and subject to modification to avoid conflict with mission activities. Each small game permit holder is charged a one-time annual administration fee of $5.00.

The roles of each agency in administering small game hunting at Camp Ravenna are listed below.

The OHARNG will:

- Authorize small game hunting at Camp Ravenna in accordance with security requirements and allow for escorted public access and controlled youth access;
- Administer the program, designate hunting areas, provide for hunter sign in and out, and keep records of game taken;
- Develop Camp Ravenna regulations, policies, and procedures necessary to facilitate small game hunting;

The ODOW will:

- Provide law enforcement oversight and support as necessary.

6.13.5 TRAPPING

The trapping program is administered by the Camp Ravenna Environmental Office. Trapping is permitted each year depending upon the need to manage nuisance and destructive wildlife species, such as beaver, raccoon, and coyotes. Trapping is open to the general public. The TSC may authorize specific individuals based on successful past performance in controlling problem animals. A pair of trappers is assigned to each designated trapping area. Selection and assignment of trappers is done by the Camp Ravenna Environmental Office. Trapping bag limits are in accordance with State regulations. Trappers are required to sign in and out and keep a log of animals taken. Special beaver management take restrictions are identified by the Camp Ravenna Environmental Office each year. Problem beaver populations are identified for eradication and non-problem populations are identified for retention.

Trapping dates are in accordance with regular State trapping dates. The trapping season may be shortened if deemed to be in the best interest of Camp Ravenna. Due to the low value of fur and because trappers are providing a valuable maintenance service to Camp Ravenna, trappers are not charged an administration fee.

6.13.6 FISHING

The fishing program is administered by the Camp Ravenna Environmental Office. A limited fishing program is in place at Camp Ravenna. Open public access for fishing is not possible and controlled public access has proven impossible to administer, so fishing is available for only personnel permanently assigned to Camp Ravenna who meet security requirements for unescorted access. Eligible Camp Ravenna personnel are permitted to escort members of the general public onto Camp Ravenna and may bring four guests with them while fishing. Military personnel training at Camp Ravenna are also permitted to fish at Cobb's Pond during off duty hours. Camp Ravenna personnel may fish in any pond not restricted due to environmental restoration and/or explosive safety and security issues. Camp Ravenna fishing permits are distributed to eligible personnel by the Camp Ravenna Environmental Office. All fishermen must be licensed in accordance with State law.

Fishing in all former TNT settling ponds is catch and release only. Bag limits in all other ponds is in accordance with State regulations, except where specific bag and/or slot limits are imposed in the fishing permit. The primary purpose of this program is to provide recreational opportunity and facilitate public access in an acceptable manner.

Fishing seasons will be in accordance with the regular State fishing seasons. Camp Ravenna may shorten the fishing season as necessary to facilitate mission compatibility. Each fishing permit holder will be charged an annual administration fee as follows.

- Camp Ravenna permanently assigned personnel will be charged $5.00.
- Soldiers training at Camp Ravenna will not be charged.
- Special event/picnic participants will not be charged.

6.13.7 VOLUNTEER ESCORT PROGRAM

The Camp Ravenna Volunteer Escort (VE) program is designed to help support the military mission and improve hunting safety by monitoring and assisting deer hunters while they are on the Camp Ravenna property. The VEs function as escorts to facilitate public access. Another major function of the escorts is to help improve the safety of the deer hunts for people living in close proximity to the Camp Ravenna perimeter fence, the hunters, and those working at Camp Ravenna during deer hunts.

The Camp Ravenna TSC has the authority to make modifications to the program as necessary to reflect changes in regulations, policies, and security needs. The VE selection process is based on the following requirements:

- The VE program is open to all U. S. citizens.
- VEs must complete an application and obtain a criminal background check. The preferred background check is a finger print web check. Camp Ravenna may reject any check or request a more in depth check. The applicants are required to provide an acceptable background check at their own expense. Military and Camp Ravenna employees are not required to get a background check.
- Applicants with a valid criminal records check will be evaluated by the Camp Ravenna TSC and Camp Ravenna Environmental Supervisor for their ability to perform the volunteer work and meet the security requirements of the program. Final approval of VEs will be given by the Camp Ravenna TSC.
- VEs serve at the sole discretion of the TSC and may be dismissed by the Camp Ravenna TSC at any time for misconduct, inappropriate behavior, or an actual or perceived security risk or violation of rules. Activities on or off post may be used as grounds for dismissal. In addition, medical, psychological and/or physical conditions that in the judgement of the TSC hinder the ability of a person to adequately perform VE duties can be grounds for dismissal.
- The Camp Ravenna Environmental Office will oversee and manage the program.

VE duties are outlined in **Appendix I**, *Camp Ravenna Deer Hunt Volunteer Escort Program Information*. VEs are granted deer hunting privileges during shotgun deer hunts in accordance with Camp Ravenna and Ohio hunting procedures, and are not required to pay the deer hunt administrative fee.

6.13.8 WATCHABLE WILDLIFE PROGRAM

In 1990, the DoD signed a MOU with Defenders of Wildlife and twelve other public and private organizations to set up public wildlife viewing stations on Federal, State, and private lands. The Watchable Wildlife program seeks to protect wildlife habitat, educate visitors, and enhance public support of wildlife resource conservation. The intent of the program is to allow access by the general public to military lands to allow viewing and photographing animals in their natural setting. Because Camp Ravenna is a restricted access installation, public viewing sites within the training area have not been established. The Camp Ravenna FM-EN makes every effort to accommodate local ornithology and botany clubs and provide tours. These tours are limited to manageable numbers, usually no more than 25 people at a time. A Camp Ravenna Environmental Office staff member must escort such groups when they are on site.

6.14 CULTURAL RESOURCES MANAGEMENT

Prior to any new projects, building alterations, or ground disturbing activities at Camp Ravenna, the Cultural Resource Manager in the Camp Ravenna Environmental Office must be contacted. The Cultural Resource Manager will assess the cultural resource requirements necessary to support the project and will oversee any surveys, Native American Consultation, or other actions that may be required. In general, cultural resources will be managed in accordance with the OHARNG Integrated Cultural Resources Management Plan (ICRMP).

Cultural Resources are the physical evidence of our heritage. Cultural resources are defined in AR 200-4, *Cultural Resources* Management, dated 30 October 1998. Cultural resources are: historic properties as defined in the National Historic Preservation Act (NHPA), cultural items as defined in the Native American Graves Protection and Repatriation Act (NAGPRA), archeological resources as defined in the Archeological Resources Protection Act (ARPA), sacred sites as defined in EO 13007 to which access is provided under the American Indian Religious Freedom Act (AIRFA), and collections as defined in 36 CFR 79 Curation of Federally Owned and Administered Collections. Requirements set forth in NEPA, NHPA, ARPA, NAGPRA, AIRFA, 36 CFR 79, EO 13007, and Presidential Memorandum on Government to Government Relations with Native American Tribal Governments define the basis of the Army's compliance responsibilities for management of cultural resources. Regulations applicable to the Army's management of cultural resources include those promulgated by the Advisory Council on Historic Preservation (ACHP) and the NPS.

The OHARNG completed the "*Integrated Cultural Resources Management Plan for Ohio Army National Guard*" May 2003. An ICRMP is a five-year plan required by AR 200-1 and DoDI 4715.03 for compliance with applicable federal laws and regulations concerning cultural resources. The ICRMP is a component of the installation master plan and functions as a decision document for cultural resources management actions and specific compliance procedures. The plan's purpose is to integrate cultural resources requirements with ongoing mission activities so that the availability of mission-essential properties and acreage is maintained and compliance with requirements is achieved.

The requirements of the ICRMP will be followed for all ground disturbing forest management activities. The Camp Ravenna Cultural Resources Manager will determine if forest management activities will impact any cultural resource site listed, or eligible for listing, in the National Register of Historic Places (NRHP). There are several thousand acres at the installation that have been highly disturbed by past industrial activities and the original Camp Ravenna construction. Phase I archeological surveys have been conducted on approximately 17,500 acres of the installation. Areas with a high potential for cultural resources are avoided during ground disturbing training and timber management operations. A minimum of a 50-foot buffer zone is established around these sites. The OHARNG will follow Standard Operating Procedure Number Six of the ICRMP in case of inadvertent discovery of cultural items.

Forestry operations in non-surveyed areas may be conducted when they do not involve ground disturbance in previously undisturbed areas. Of particular concern are old farmsteads and riparian areas. When ground disturbance can not be avoided by operational controls, such as harvesting in dry or frozen ground conditions, Phase I archeological surveys will be conducted to identify potential cultural resources.

Areas surveyed for cultural resources, areas disturbed by past activities, and significant resources are shown in **Figure 17**. The Stone Arch Bridge is the only historic property eligible for listing on the NRHP. The bridge spans the South Fork Eagle Creek on Wadsworth Road. This bridge was built in the late 19th century prior to the construction of Camp Ravenna. Remains of two farmsteads on the east side of Greenleafe Road north of Newton Falls Road have also been identified as potentially eligible for listing in the National Register of Historic Places. These sites are being protected as if they are eligible until additional research can be conducted to make an eligibility determination.

Section 106 of the NHPA requires that Federal agency undertakings take into account effects on historic properties and afford the ACHP an opportunity to comment on those undertakings. The Ohio Historic

Preservation Office (OHPO) was contacted regarding this INRMP during the consultation process described in **Section 2.4** and documented in **Appendix A**.

Consultation with Native American tribes or nations is required under the provisions of the NHPA regulations, 36 CFR Part 800, revised rules effective August 5, 2004, and the NAGPRA and its implementing rules. Both statutes recognize the rights and privileges of federally recognized tribes or nations, but not tribes without Federal standing or activist groups (Indians and/or non-Indians). The Bureau of Indian Affairs maintains a list of federally recognized tribes. Only federally recognized Tribes or Nations can participate in consultation under the provisions of these statues and their regulations.

The *DoD American Indian and Alaskan Native Policy*, annotated 27 Oct 1999, and the DoDI 4710.02, *DoD Interactions with Federally Recognized Tribes* provides guidance for interacting and working with federally-recognized American Indian and Alaska Native governments or tribes. The policy is based on tribal input, federal policy, treaties, and other federal statutes. The DoD policy supports tribal self-governance and government-to-government relations between the federal government and tribes. Although these principles are intended to provide general guidance to DoD Components on issues affecting tribes, DoD personnel must consider the unique qualities of individual tribes when applying these principles, particularly at the installation level. These principles recognize the importance of increasing understanding and addressing tribal concerns, past, present, and future. These concerns should be addressed prior to reaching decisions on matters that may have the potential to significantly affect protected tribal resources, tribal rights, or Indian lands. An on-line version of the full text of this policy may be found at: https://www.denix.osd.mil/denix/Public/Native/Outreach/policy.html.

There are no recorded federally recognized Native American traditional or sacred sites, as defined by the AIRFA of 1978, at Camp Ravenna at this time. Nor are there any federally recognized Native American tribes who claim cultural patrimony under NAGPRA for the Camp Ravenna vicinity. However, the current ICRMP identifies twelve Native American groups with potential ancestral ties to the Camp Ravenna area. The groups identified in the ICRMP are as follows, Cayuga, Chippewa, Delaware, Mohican, Mohawk, Oneida, Onondaga, Ottawa, Potawatomi, Seneca, Tuscarora, and Wyandotte. Since the ICRMP was finalized in May 2003, four Native American groups have been added to the list with potential ancestral ties to the Camp Ravenna area. These groups were added based on personal correspondence with Native Americans and research by the cultural resources manager. Sources researched include the "Atlas of Great Lakes Indian History" by Helen Hornbeck Tanner 1987, "Indian Land Areas Judicially Established 1978", the "Treaty of Fort Harmar", and the "Treaty of Greenville". Native American groups added to the twelve previously mentioned include the following, Miami, Shawnee, Kickapoo, and Sac & Fox.

Consultation for this INRMP was initiated by the OHARNG in accordance with NEPA, NHPA, NAGPRA, and DoD American Indian and Alaskan Native Policy. In regards to this INRMP, the OHARNG contacted 55 federally recognized Native American tribes that may have ancestral ties to the Camp Ravenna area. The OHARNG received responses from seven different tribes. Only one, the Delaware Nation, has expressed interest in the Camp Ravenna INRMP. A list of contacts and copies of correspondence can be found in **Appendix A**.

6.15 NATURAL RESOURCE LAW ENFORCEMENT

There is no onsite military law enforcement support at Camp Ravenna. Enforcement of environmental requirements is carried out by the Camp Ravenna Environmental and Range Operations staffs by providing oversight and guidance of activities taking place on post. Violations are reported up the chain of command for action by Federal, State or local law enforcement agencies as appropriate. Most issues that require law enforcement are related to the Camp Ravenna public deer hunts. The Ohio Division of Wildlife provides law enforcement officeres for this task at no charge to the OHARNG. Enforcement actions and notices of violations related to most other environmental regulations are mostly issued by the Ohio EPA. The Ohio Department of Agriculture is the regulatory and enforcement agent for the Ohio Pesticide Law. In 1994 the Ohio Governor and the Secretary of the Army signed an agreement (Act of Acceptance of Retrocession Pursant to Ohio Revised Code Section 159.04(B)) that changed the

legislative jurisdiction at Camp Ravenna from exclusive federal jurisdiction to concurrent jurisdiction. Accordingly, both Federal and State law enforcement officials have authority to make arrests and prosecute criminal acts done on the installation. The penal laws of the State of Ohio are enforceable by Ohio law enforcement officials. Certain State game law violations committed on the Camp Ravenna property may also be Federal offenses under 10 USC 267(c).

6.16 PUBLIC OUTREACH

Currently, public outreach and public environmental awareness at Camp Ravenna is initiated through the various recreational opportunities offered, which include deer hunting, waterfowl hunting, turkey hunting, small game hunting, trapping, fishing, the VE program, and the Watchable Wildlife Program (see **Section 6.13**).

The Camp Ravenna Environmental Office facilitiates flora and fauna sightseeing tours at Camp Ravenna when possible.

Camp Ravenna has a community partnership with Windham High School and allow them access each year to do stream sampling as part of the Portage County storm water monitoring program in accordance with the Clean Water Act requirements. The OHARNG continually looks for ways to partner with local agencies and groups for natural resources planning and management.

In addition, the sale of minor forest products, such as firewood, aspen, locust posts, small sawtimber salvage areas, and miscellaneous other products, is open to the public (see **Section 6.8.5.2**). Funds from these sales are used for forest management activities. When funds are still available after conducting all forest management activities for the year, the excess funds are given to the county for roads and schools.

SECTION 7: MANAGEMENT GOALS AND OBJECTIVES

When the 2001 INRMP was developed the direction from ARNG was to fully integrate the INRMPs by including the ITAM program as part of the INRMP. Specific sections were included in the INRMP to address ITAM. The goals and objectives in the 2001 INRMP were given throughout the document in Section 7.0 *Land Condition Trend Analysis*, Section 8.0 *Training Requirements Integration*, Section 9.0 *Land Rehabilitation and Maintenance*, Section 10.0 *Environmental Awareness*, and Section 11.0 *Ecosystem Management*. Some of the goals and objectives in the 2001 INRMP were listed in multiple sections with slightly different wording. Having INRMP goals and objectives included in the ITAM sections confused the 2001 INRMP and made it seem as though the ITAM program was managed and implemented through the INRMP when in fact they are two distinct programs. Projects were developed from these goals and objectives and they were correctly presented by program area in Table 12-3 of the 2001 INRMP. Funding and program management was done in accordance to how projects were listed in Table 12-3.

The goals and objectives in this updated INRMP are a consolidation and continuation of the goals and objectives in the 2001 INRMP and subsequent updated INRMPs. Where goals and objectives were poorly written or not clear, they have been rewritten so they can be understood. Following the ARNG INRMP Template the goals and objectives have been consolidated into one section eliminating the confusion in the 2001 INRMP text in regard to ITAM and helping to properly focus the IRNMP on conservation program implementation with a supporting role to ITAM and other programs at Camp Ravenna. The goals and objectives are supported by projects, which provide management strategies and specific actions to achieve the goals. Projects are listed in this section and their implementation is further discussed in **Section 8.0**.

None of the goals and objectives have been modified for the current INRMP implementation period. Three projects have been slightly modified and two projects have been added. Project 3.1.2 to conduct Indian bat surveys was updated to make it more inclusive of all bat species. Projects 3.1.3 and 3.1.4 were modified to put the base-wide bird survey a 10 year interval instead of a five year interval. The annual breading bird survey has not been modified. Habitat management projects 5.3.4 and 5.3.5 were added to capture management practices being implemented to enhance the trainingscape and the young forest management initiative. The consolidated goals, objectives, and resulting projects are listed below.

GOAL 1: Manage natural resources in a manner that is compatible with and supports the military mission while complying with applicable Federal and State laws and Army regulations and policies.

OBJECTIVE 1.1:Annually implement programs and projects that enhance the training land and training opportunities and/or do not unnecessarily limit training land availability.

PROJECT 1.1.1: Provide a trained natural resources staff to develop and manage the natural resources program and to provide support to the military staff.

PROJECT 1.1.2: Coordinate INRMP revisions and implementation with Camp Ravenna operations, range control, and maintenance staffs.

PROJECT 1.1.3: Identify and comply with regulatory driven land use limitations associated with natural resources such as wetlands, federally listed threatened and endangered species, and others.

OBJECTIVE 1.2: Continue to educate Camp Ravenna users regarding the natural resources at Camp Ravenna and their part in ensuring sustainable use of the site in perpetuity.

PROJECT 1.2.1: Update and produce copies of the existing environmental information booklet given out to soldiers who train at Camp Ravenna so that it is current, accurate, and useful in helping the OHARNG maintain sustainable training land.

PROJECT 1.2.2: Include natural resources awareness training in the annual Camp Ravenna environmental training suite.

GOAL 2: Maintain and foster positive working relationships with the U. S. Fish and Wildlife Service, the ODNR DOW, and other federal, state and local natural resources management agencies and organizations for the benefit of the military mission, the natural resources being managed, and the citizens of Ohio and the nation.

OBJECTIVE 2.1: Effectively communicate mission needs to cooperating agencies and solicit input/review on projects with the potential to impact natural resources, especially in areas of regulatory primacy.

OBJECTIVE 2.2: Provide copies of biological surveys to interested cooperating agencies.

OBJECTIVE 2.3: Facilitate cooperative management programs and projects that are compatible with the military mission and within the capabilities of the Camp Ravenna staff.

GOAL 3: Monitor the condition of the natural resources and the implied impacts from training and the natural resources management program on the natural resources at Camp Ravenna.

OBJECTIVE 3.1: Maintain current species inventories and other PLSs through periodic reoccurring surveys and inventories.

PROJECT 3.1.1: Conduct annual breeding bird surveys on established breeding bird routes. The survey will identify nesting birds at Camp Ravenna in accordance with established national BBS protocols and identify significant upward or downward trends in the breeding bird population.

PROJECT 3.1.2: Conduct a training site-wide bat survey every five years. If the Indiana bat or any other federally listed species is found, consultation with the USFWS will begin and the survey schedule modified as appropriate.

PROJECT 3.1.3: Conduct inventories of mullosks, herptile, Lepidoptera and odenata species every five years to update existing data and monitor ecosystem for changes.

PROJECT 3.1.4: Conduct inventories of plants, plant communities, bird, crayfish and fish species every ten years to update existing data and monitor ecosystem for changes.

GOAL 4: Protect and maintain populations of rare plant and animal species on Camp Ravenna in compliance with Federal and State laws and regulations.

OBJECTIVE 4.1: Avoid negative impacts to federally listed species and avoid/minimize impacts to State listed and otherwise rare species.

PROJECT 4.1.1: Review Camp Ravenna development plans and military training activities in light of biological survey data and site projects and training in locations that best meet mission needs, avoid negative impacts to federally listed species, and minimize impacts to state listed and other rare species.

PROJECT 4.1.2: Implement a vegetation control plan that is effective at maintaining the Camp Ravenna grounds and infrastructure and minimizes disturbance to nesting birds and other species.

PROJECT 4.1.3: Implement Camp Ravenna INRMP strategies to maintain large tracts of forest and other habitat types to maintain diversity.

PROJECT 4.1.4: When using controlled burns, only burn a portion of any given

habitat type at a time in order retain certain Lepidoptera species that overwinter in the grass.

GOAL 5: Sustain usable training lands and native natural resources by managing non-native and invasive species, vegetation and plant communities, and nuisance wildlife species.

OBJECTIVE 5.1: Manage populations of invasive plant species where they hinder training and/or habitat management objectives.

PROJECT 5.1.1: Control purple loosestrife, multiflora rose, Russian olive, autumn olive, and other invasive / noxious weeds identified throughout the INRMP implementation period.

OBJECTIVE: 5.2: Manage non-native and invasive insect species that pose a threat to forest resources.

PROJECT 5.2.1: Cooperate with the USFS forest insect and disease monitoring efforts.

PROJECT 5.2.2: Implement forest management strategies identified in the Camp Ravenna INRMP and manage for vigorous and diverse forest communities.

OBJECTIVE 5.3: Manage terrestrial vegetation to support training, encourage native plant communities, and prevent damage to training site facilities and infrastructure.

PROJECT 5.3.1: Develop an Integrated Wildland Fire Management Plan and conduct controlled burns for fuel reduction and grassland management on ranges and other grassland areas.

PROJECT 5.3.2: Improve dismounted maneuver areas by managing grassland habitat and converting non-native grasslands to native grasses by mowing, burning, and seeding with native grasses.

PROJECT 5.3.3: Control vegetation around buildings, on railroad tracks, in power line rights-of-way, in road ditches, road surfaces, around mowing obstructions, in parking lots, under fence lines and fence line clear zones, and any other facility areas.

PROJECT 5.3.4: Create favorable dismounted training area conditions by removing understory forest vegetation in selected training areas and managing old fields to remove invasive species and briars while retaining some young trees and shrubs as visual obscurants.

PROJECT 5.3.5: Maintain and improve habitat diversity and training area sustainability by retaining some early successional, young forest habitat throughout Camp Ravenna.

OBJECTIVE 5.4: Manage the beaver population to prevent damage to training site facilities and infrastructure and to maintain the quality warm water habitats of Hinkley Creek, Sand Creek, and South Fork Eagle Creek.

PROJECT 5.4.1: Implement a beaver trapping/control program per the Camp Ravenna INRMP to remove beaver damaging roads, culverts, and other facilities and those damming the main channels of Hinkley Creek, Sand Creek, and South Fork Eagle Creek. Selectively trap beaver in other areas.

PROJECT 5.4.2: Remove beaver dam material from culverts and bridges and keep the three main streams (Hinkley Creek, South Fork Eagle Creek, and Sand Creek)

free from beaver dams so as not to degrade current high quality of stream habitats. Trap beaver during trapping season and remove dams mechanically as necessary. Remove debris in side channels only if damaging government facilities and/or impeding mission capability.

OBJECTIVE 5.5: Manage other nuisance animals that negatively impact the ecosystem.

PROJECT 5.5.1: Control feral cats, pigeons, and other species in accordance with the OHARNG Installation Pest Management Plan.

GOAL 6: Manage wildlife resources in a manner compatible with the military mission and within the limits of the natural habitat.

OBJECTIVE 6.1: Cooperatively manage wildlife resources with the ODOW.

PROJECT 6.1.1: Continue wood duck nest box program.

PROJECT 6.1.2: Continue duck banding program.

PROJECT 6:1.3: Continue turkey census and other census programs.

PROJECT 6.1.4: Allow the release of captured and recovered wildlife.

OBJECTIVE 6.2: Provide opportunity for wildlife recreation to the public that is compatible with the military mission.

PROJECT 6:2:1: Continue controlled hunting, trapping, fishing, educational, and watchable wildlife activities.

OBJECTIVE 6.3: Maintain wildlife population without augmenting the habitat with artificial food plots.

PROJECT 6.3.1: Implement the Camp Ravenna INRMP management strategies to maintain diverse habitats and native plant communities capable of supporting wildlife populations.

GOAL 7: Manage the Camp Ravenna whitetail deer population in a manner that minimizes impacts on the military mission, is ecologically sustainable, provides for public hunting, and is in accordance with Army regulations and State law.

OBJECTIVE 7.1: Census the deer herd.

PROJECT 7.1.1: Fund the ODOW to conduct a winter aerial census of the Camp Ravenna deer herd.

PROJECT 7.1.2: Conduct a road side deer survey of Camp Ravenna the last two weeks in August each year to determine the ratio between bucks and does and does and fawns.

PROJECT 7.1.3: Conduct deer browse surveys in summer if warranted.

OBJECTIVE 7.2: Determine winter carrying capacity for whitetail deer at Camp Ravenna.

PROJECT 7.2.1: Using the Camp Ravenna Plant Communities Survey, vegetative field sampling, and scientific literature determine the winter carrying capacity of the Camp Ravenna deer herd.

OBJECTIVE 7.3: Maintain the white-tailed deer population at or near carrying capacity and at a buck to doe ratio close to 1:2 (acceptable ratio is dependent on population size) with a maximum of six hunters dates per year.

PROJECT 7.3.1: Use controlled public access hunting to manage the deer herd.

PROJECT 7.3.2: Determine and issue the number of antlerless only and either sex deer permits necessary to bring the herd down to winter carrying capacity within the available number of hunt days.

PROJECT 7.3.3: Manage deer hunt areas by maintaining signage, boundary markings, mowing parking areas, and mowing access lanes into hunt areas.

PROJECT 7.3.4: Manage the VE program to facilitate public access to Camp Ravenna for deer hunting.

GOAL 8: Manage forest resources to the benefit of the military mission, to perpetuate the ecosystem functions, to support regional ecosystem needs, and for the production of forest products.

OBJECTIVE 8.1: Maintain current forest resource data.

PROJECT 8.1.1: Conduct a GIS-compatible forest inventory of Camp Ravenna. The work will include revising the existing GIS Forest Management Map and linking the new forest inventory data to this map.

OBJECTIVE 8.2: Implement forest management strategies identified in the Camp Ravenna INRMP.

PROJECT 8.2.1: Conduct timber stand improvement.

PROJECT 8.2.2: Conduct timber harvests.

PROJECT 8.2.3: Conduct minor forest products sales.

GOAL 9: Manage wetlands and other surface waters in accordance applicable Federal, State, and local regulations and to protect water quality and ecological functions while facilitating the military mission.

OBJECTIVE 9.1: Avoid wetland fills.

PROJECT 9.1.1: Conduct wetland delineations and ORAM determinations prior to new construction or other ground disturbing activities so projects can be designed to avoid wetlands.

OBJECTIVE 9.2: Minimize and mitigate unavoidable wetland fills.

PROJECT 9.2.1: Obtain Section 404 wetland fill permits and Section 401 WQC prior to any fill.

PROJECT 9.2.2: Implement the required wetland mitigation per the 404/401 permits.

OBJECTIVE 9.3: Maintain healthy aquatic ecosystems in ponds.

PROJECT 9.3.1: Manage aquatic vegetation in ponds that support a fishery.

PROJECT 9.3.2: Repair damaged earthen dikes and dams and pond access roads.

OBJECTIVE 9.4: Restore, enhance and create wetlands when possible and compatible with the military mission.

Project 9.4.1: Cooperate with the ODOT with mutually beneficial wetland mitigation project at Camp Ravenna for transportation projects.

Project 9.4.2: Encourage wetland protection and restoration in conjunction with the RVAAP environmental restoration and facilities demolition programs.

Project 9.4.3: Encourage construction of wetlands as engineer training projects and in association with Camp Ravenna development projects.

GOAL 10: Manage soil to maintain productivity and prevent and repair erosion in accordance with State and Federal laws and regulations so that Camp Ravenna can support doctrinally required military training in perpetuity.

OBJECTIVE 10.1: Conduct training and other activities in locations with soil most suitable for supporting the activity.

PROJECT 10.1.1: Reference the Camp Ravenna soil survey and soil suitability and limitations when siting training and other activities.

OBJECTIVE 10.2: Rehabilitate, repair, and maintain areas damaged by training and other activities.

PROJECT 10.2.1: Repair soil damage caused by off road vehicle traffic.

PROJECT 10.2.2: Implement BMPs for stream crossings and operations within riparian areas.

PROJECT 10.2.3: Stabilize and harden eroded stream banks of several streams where they exit the training site.

PROJECT 10.2.4: Maintain vegetative cover on soil and comply with Ohio NPDES storm water management requirements for construction projects and other activities that create bare ground.

PROJECT 10.2.5: Maintain tank trails by filling and grading damaged roads, maintaining sedimentation ponds, repairing ditches as necessary, and using palliatives for dust control.

GOAL 11: Manage cultural resources on Camp Ravenna in accordance with State and Federal laws and regulations while implementing the natural resources management program.

OBJECTIVE 11.1: Comply with Federal, State, and local laws and regulations pertaining to cultural resources found on the training site.

PROJECT 11.1.1: Conduct archeological surveys in support of timber harvests and other ground disturbing activities.

PROJECT 11.1.2: Using the archaeological survey results, determine if any actions will impact resources eligible for listing in the NRHP. Modify projects to avoid impacts or mitigate the impacts in consultation with the SHPO.

GOAL 12: Develop, maintain, and manage data regarding natural resources at Camp Ravenna through the use of GIS for efficient data storage, retrieval, analysis, and presentation.

OBJECTIVE 12.1: Develop accurate and usable natural resources GIS data.

PROJECT 12.1.1: Incorporate existing breeding bird data, deer hunt data, and other natural resources data that exists only on paper or as non-GIS electronic data into GIS.

PROJECT 12.1.2: Revise and consolidate existing GIS files as more current data becomes available and when analysis warrants.

SECTION 8: NATURAL RESOURCES PROGRAM IMPLEMENTATION

This updated INRMP will be implemented through the various policies and programs described throughout the document and accomplishment of specific goals and objectives through the implementation of the projects identified in **Section 7.0**. The requirement to integrate ITAM projects, construction, training activity and all other land uses with environmental requirements and implement natural resources management practices is inherent in the INRMP implementation. A detailed analysis of the previous planning period INRMP implementation is given in **Appendix B**.

An implementation matrix of projects showing the schedule, funding requirements, source of funds, and funds obligated is provided in **Table 18**. The projects in Table 18 were developed based on the goals, objectives and projects listed in Section 7 of the INRMP. The funding obligation fields in this table are updated annually as tracking mechanism of INRMP implementation. All of the projects in the INRMP support existing and ongoing programs and facilitate continued implementation of the original Camp Ravenna INRMP. Project statuses as compared to the previous planning period INRMP are identified as ongoing, newly listed project, or discontinued project. Ongoing projects are ones identified in the 2001 INRMP and/or added in a previous planning period update and continuing in the current planning period updated INRMP. Newly listed projects are projects that have been newly added to the current planning period updated INRMP. New projects are added to the end of Table 18 when they are added and number sequentially. Discontinued projects are projects that have been discontinued because they are complete, no longer needed to support INRMP implementation or have been determined to fall under program and/or funding outside of the INRMP.

In accordance with the 25 May 2006 *Army Guidance for Implementation of the SAIA*, an INRMP is considered implemented if an installation:

- Actively requests, receives, and uses funds for projects and activities required to meet recurring natural resources conservation management requirements or current natural resources compliance needs;
- Ensures that sufficient numbers of professionally trained natural resources management staff are available to perform the tasks required by the INRMP;
- Coordinates annually with cooperating agencies; and
- Documents specific INRMP action accomplishments undertaken each year.
- These implementation requirements will be evaluated as part of the annual review process. See **Section 8.4** for more information on monitoring INRMP implementation.

8.1 ANNUAL WORK PLANS

Table 18 will be used to develop budget requests and schedule annual project requirements. Funding requests will be submitted in accordance with current NGB procedures for conservation projects and in accordance with current Department of Agriculture procedures for reimbursable account programs.

8.1.1 FUNDING

Implementation of this INRMP is subject to the availability of annual funding. The installation requests project validation and funding through the STEP and reimbursable programs. Funding sources for specific projects can be grouped into three main categories by source: Federal NGB Funds, Other Federal Funds, and Non-Federal Funds. Each is discussed in the following subsections. Estimated funding requirements for implementing specific INRMP goals and programs are presented in **Table 18**.

Where projects identified in the plan are not implemented due to lack of funding, or other compelling circumstances, the installation will review the goals and objectives of this INRMP to determine whether adjustments are necessary.

The following discussion of funding options is not all-inclusive of funding sources. Since many funding sources rely on a variety of grant programs, award criteria and amounts can change considerably from one year to another. Funding through grant programs can occur on a one-time award, annually or in multiples of years.

Table 18. Implementation Projects 2013 - 2019*

Last Updated 18 December 2014

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to Previous INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Annual Breeding Bird Survey	No	CONS-1	Funds will be used to conduct an annual breeding bird survey on established breeding bird routes. The survey will identify nesting birds at Camp Ravenna in accordance with established national breeding bird survey protocols and identify significant upward or downward trends in the breeding bird population.	Forestry Reimbursable	NA	ESA, Sikes Act, Army Regulation	2013	Ongoing	$2,500	Yes	$2,490.00	Complete	$10.00 difference used for Forestry Archeological Survey
							2014	Ongoing	$2,500	Yes	$2,500.47	Complete	Deliverables received 2 DEC 2014.
							2015	Ongoing	$3,000	Yes			
							2016	Ongoing	$3,000				
							2017	Ongoing	$3,000				
							2018	Ongoing	$3,000				
							2019	Ongoing	$3,000				
Forest Management	No	CONS-2	Funds will be used for forestry related supplies and equipment and timber stand improvement.	Forestry Reimbursable	NA	Sikes Act, Army Regulation	2013	Ongoing	$27,195	Yes	$27,195.00	Complete	Treated 224 ac of grapevines, 54 ac crop tree release, and 72 ac. American beech control.
							2014	Ongoing	$25,000	Yes	$32,958.32	In Progress	Treated 373 ac of grapevines & 31 ac. Crop Tree Release (2I).
							2015	Ongoing	$24,300	Yes			
							2016	Ongoing	$30,000				
							2017	Ongoing	$32,500				
							2018	Ongoing	$35,000				
							2019	Ongoing	$37,500				
Forestry Archeology Surveys	No	CONS-3	Funds will be used for archeological surveys in support of timber harvest activities during the planning period FY13 through FY18.	Forestry Reimbursable	NA	NHPA of 1966, Sikes Act, Army Regulation	2013	Ongoing	$29,380	Yes	$29,390.00	Complete	Utilized $10 not obligated for BBS, used for Archeological Survey.
							2014	Ongoing	$50,000	Yes	$0	Complete	Survey was included within a different project with different funding source. Funding was applied to additional TSI work and balance was returned.
							2015	Ongoing	$0	NA			
							2016	Ongoing	$0				
							2017	Ongoing	$70,000				Load lines in Compartment 7
							2018	Ongoing	$0				
							2019	Ongoing	$0				
Hunting, Fishing, and Trapping Administration	No	CONS-4	Funds will be used cover administrative costs associated with hunting, fishing, and trapping programs.	Sikes Act User Fees (Appropriation 5095)	NA	Sikes Act, Army Regulation	2013	Ongoing	$500	Yes	$0	Complete	User fee funding not used.
							2014	Ongoing	$500	Yes	$0	Complete	User fee funding not used.
							2015	Ongoing	$500	Yes			Mailing/Postage
							2016	Ongoing	$500				Mailing/Postage
							2017	Ongoing	$500				Mailing/Postage
							2018	Ongoing	$500				Mailing/Postage
							2019	Ongoing	$500				Mailing/Postage
Deer Hunt Area Management	No	CONS-5	Funds will be used for supplies and labor to maintain hunt area boundary markings, hunt signs, and to mow and maintain access lanes in hunt areas.	Sikes Act User Fees (Appropriation 5095)	NA	Sikes Act, Army Regulation	2013	Ongoing	$5,000	Yes	$5,000	Complete	Removed from ESOB starting in FY14. Funding sources is Sikes Act User Fee Account. Some minor mowing included in Grassland Habitat project FY13 and FY14. Sikes Act User Fee Account funds to be used in FY14 and in future years.
							2014	Ongoing	$10,000	Yes	$0	Complete	
							2015	Ongoing	$10,000	Yes			
							2016	Ongoing	$10,000				
							2017	Ongoing	$10,000				
							2018	Ongoing	$10,000				
							2019	Ongoing	$10,000				

Table 18. Implementation Projects 2013 - 2019*

Last Updated 18 December 2014

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to Previous INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Grassland Management	Yes	CONS-6	Funds will be used to support conversion of non-native grasslands to native grasses and annual management such as mowing and spot treatment with herbicides as necessary remove woody encroachment. Mowing will be done in areas where burning is not possible. 50 to 160 acres will be treated per year as funds permit. Not all grasslands will be treated each year to ensure some grass stands are left standing as winter habitat.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430090004	Sikes Act, Army Regulation, Migratory Bird Treaty Act, N. American Waterfowl Mgmt. Plan	2013	Ongoing	$60,000	Yes	$21,475	Complete	Mowed 14.5ac of brush and 64ac of grassland in FY13. Some funds used for young forest habitat mowing.
							2014	Ongoing	$60,000	No	0	-	Off year.
							2015	Ongoing	$30,000	No			
							2016	Ongoing	$30,000				
							2017	Ongoing	$10,000				
							2018	Ongoing	$30,00				
							2019	Ongoing	$37,000				
Pond Maintenance and Repair	No	CONS-7	Funds will be used for the maintenance of access routes, water control structures, dikes, and dams on ponds and wetland areas.	Sikes Act User Fees (Appropriation 5095) Facilities SRM		CWA, Sikes Act, Army Regulation	2013	Ongoing	$0	NA	0	-	
							2014	Ongoing	$0	NA	0	-	
							2015	Ongoing	$0	NA			
							2016	Ongoing	$0				
							2017	Ongoing	$50,000				Lower Cobb's Pond Spillway Repair
							2018	Ongoing	$0				
							2019	Ongoing	$0				
Nuisance Wildlife Management	No	CONS-8	Funds will be used to manage nuisance wildlife that modify habitats contrary to the goals of the INRMP and negatively impact training. The project includes contracted nuisance wildlife control and physical removal of beaver dams to restore/maintain free flowing streams and desired stream habitat. Only nuisance dams that are modified streams designated to be free flowing habitats are removed. Trapping is used as our main nuisance wildlife management methodology. For out of season problems a licensed nuisance trapper must be hired.	Facilities SRM; ENV (Appropriation 2065, Master Cooperative Agreement)	OH430090007	CWA, Sikes Act, Army Regulation	2013	Ongoing	$12,000	Yes	0	Partial	Partial implementation via beaver trapping and in house staff. Funds reprogrammed to higher priority wetland permit project.
							2014	Ongoing	$13,000	No	0	Partial	Partial implementation via beaver trapping.
							2015	Ongoing	$12,000	No	$0		
							2016	Ongoing	$12,400				
							2017	Ongoing	$12,800				
							2018	Ongoing	$13,100				
							2019	Ongoing	$13,500				
Natural Resources GIS Support	Yes	CONS-9	Funds will be used to manage natural resources GIS data, to produce maps, and to acquire equipment, and data. Project OH430090002 is for a contracted part time GIS specialist.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430060017 OH430090002	Sikes Act, Army Regulation	2013	Ongoing	$35,800	Partial	$4,155	Partial	$32,000 funded for GIS contractor support. OHARNG Leadership refused to contract GIS support. Some electronic equipment purchased.
							2014	Ongoing	$19,600	No	$0	-	
							2015	Ongoing	$52,000	Yes			
							2016	Ongoing	$79,200				
							2017	Ongoing	$76,600				
							2018	Ongoing	$54,300				
							2019	Ongoing	$77,200				
Natural Resources Manager (Contractor)	Yes	CONS-10	Funds will be used to hire a full time natural resources manager.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430060001	Sikes Act, Army Regulation	2013	Ongoing	$183,900	Yes	$106,200	Complete	Converted to State employee status beginning at start of FY15. Project discontinued.
							2014	Ongoing	$183,900	Yes	$106,200	Complete	

Table 18. Implementation Projects 2013 - 2019*

Last Updated 18 December 2014

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to Previous INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Integrated Wildland Fire Management Plan	Yes	CONS-11	Funds will be used to develop and update an Integrated Wildland Fire Management Plan.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430060012 OH430060006	Sikes Act, Army Policy	2013	Ongoing	$15,810	Yes	$6,243.34	Complete	$9,566.66 was not used and could not be used towards plan implementation. These funds were returned as growback.
							2014	Ongoing	$0	NA	$0		
							2015	Ongoing	$0	NA			
							2016	Ongoing	$0				
							2017	Ongoing	$0				
							2018	Ongoing	$10,000				Expect to update IWFMP with INRMP after 2017 Review for Operation and Affect
							2019	Ongoing	$0				
Invasive/ Noxious Weed Management	No	CONS-12	Funds will be used to control purple loosestrife, multiflora rose, autumn olive, and other invasive / noxious weeds identified throughout the INRMP implementation period.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430090005	Sikes Act, Army Regulation OAC 901:5-37-01, *Prohibited noxious weeds*	2013	Ongoing	$32,300	Yes	$31,300	In Progress	2013: Treated 154.20ac Ailanthus, 3.50ac autumn-olive, 0.50ac glossy buckthorn, & 2.10ac Phragmites & narrowleaf cattail. Two-year contract.
							2014	Ongoing	$40,000	No	$0	-	Off year.
							2015	Ongoing	$0	No			New STEP project needed for FY16 and out years.
							2016	Ongoing	$42,000				
							2017	Ongoing	$47,000				
							2018	Ongoing	$47,000				
							2019	Ongoing	$47,000				
Forest Inventory	No	CONS-13	Funds will be used to obtain an updated forest inventory of CRJMTC.	Forestry Reimbursable Conservation Reserve Account	NA	Sikes Act, Army Regulation	2013	Ongoing	$0	NA	$0		
							2014	Ongoing	$0	NA	$0		
							2015	Ongoing	$0	NA	$0		
							2016	Ongoing	$0		$0		
							2017	Ongoing	$170,000		$0	Outyear	New inventory needed.
							2018	Ongoing	$0		$0		
							2019	Ongoing	$0		$0		
Bat Survey	Yes	CONS-14	Funds will used to survey for the endangered Indiana bat (*Myotis sodalis*) and other bat species. As agreed to by the USFWS and based on the extensive bat surveys done to date and absence of Indiana bat captures a CRJMTC-wide Indiana bat survey is required every five (5) years to support forest management and other activities.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430060008	ESA, Sikes Act, Army Regulation	2013	Ongoing every 5 years	$0	NA			
							2014		$0	NA			
							2015		$120,000	Partial	$37,400		$82,600 UFR
							2016		$0				
							2017		$0				
							2018		$0				
							2019		$0				
Flora and Fauna Surveys	Yes	CONS-15	Funds will be used to conduct inventories of bird, herptile, mammal, mollusks & crayfish, Lepidoptera, and fish species to update existing data and monitor ecosystem for changes. Natural Resources Manager will conduct flora surveys in-house.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430060007	ESA, Sikes Act, Army Regulation	2013	Ongoing, some every 5 years and some every 10 years	$0	NA			
							2014		$120,000	No	$0	Incomplete	Scheduled fauna survey not funded.
							2015		$0	NA			
							2016		$0				
							2017		$0				
							2018		$0				
							2019		$205,000				Base-wide complete fauna survey.

Table 18. Implementation Projects 2013 - 2019*

Last Updated 18 December 2014

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to Previous INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Plant Communities Survey	Yes	CONS-16	Funds will be used to review and update existing CRJMTC plant communities GIS data and map. An updated survey is conducted every 10 years at CRJMTC.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430060010	Sikes Act, Army Regulation	2013		$0	NA			
							2014	Ongoing	$32,000	No	$0	Deferred to 2015	
							2015	Ongoing	$35,000	Yes			
							2016		$0				
							2017		$0				
							2018		$0				
							2019		$0				
Deer Herd Aerial Census	No	CONS-17	Funds will be used to support ODOW aerial census of Camp Ravenna deer herd.	Sikes Act User Fees (Appropriation 5095)	NA	Sikes Act, Army Regulation	2013	Ongoing Newly Listed Project	$1,500	Yes	$1,500	Complete	Done by Ohio Division of Wildlife during winter when there is snow on the ground.
							2014	Ongoing	$1,500	Yes	$1,500	Complete	
							2015	Ongoing	$1,500	Yes			
							2016	Ongoing	$1,500				
							2017	Ongoing	$1,500				
							2018	Ongoing	$1,500				
							2019	Ongoing	$1,500				
Pond Vegetation Management	No	CONS-18	Funds will be used to manage vegetation in and around ponds. Control includes invasive species and habitat management.	Sikes Act User Fees (Appropriation 5095) ENV (Appropriation 2065, Master Cooperative Agreement)	OH430090005	Sikes Act, Army Regulation	2013	Ongoing	$0	NA	$0	Incomplete	Not funded in FY13
							2014	Ongoing	$3,000	No	$0	Incomplete	Not funded in FY14
							2015	Ongoing	$5,800	No	$0		Not Funded in FY15
							2016	Ongoing	$6,000				
							2017	Ongoing	$6,200				
							2018	Ongoing	$6,400				
							2019	Ongoing	$6,500				
Deer Carrying Capacity Determination	No	CONS-19	Funds will be used to determine deer carrying capacity using Camp Ravenna plant community data, vegetation field samples, and scientific literature to develop an estimate of the deer carrying capacity per habitat type and the entire training site.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430090006	Sikes Act, Army Regulation	2013	Ongoing	$0	NA			Solicit Wildlife Programs at The Ohio State University, Kent State University, Youngstown State University, etc. to see if any graduate students would be interested in conducting deer carrying capacity study and the feasibility of such a project at Camp Ravenna. Dr. Stan Gehrt (OSU) was interested but never followed through.
							2014	Ongoing	$0	NA			
							2015	Ongoing	$30,000	No	0	Deferred to 2016	
							2016	Ongoing	$30,000				
							2017	Ongoing	$0				
							2018	Ongoing	$0				
							2019	Ongoing	$0				
Wildland Fire Management	NA	CONS-20	Funds will be used to implement the Integrated Wildland Fire Management Plan.	Facilities SRM, ENV (Appropriation 2065, Master Cooperative Agreement) Forestry Reimbursable	NA	Sikes Act, Army Regulation	2013	Ongoing	$0	NA			Forestry funds forest management burns. SRM funds range burns. ENV can fund specific grassland burns for ecological purposed/INRMP implementation.
							2014	Ongoing	$0	NA			
							2015	Ongoing	$20,000	Yes			
							2016	Ongoing	$20,000				
							2017	Ongoing	$20,000				
							2018	Ongoing	$20,000				
							2019	Ongoing	$20,000				

Table 18. Implementation Projects 2013 - 2019*

Last Updated 18 December 2014

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to Previous INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Wildland Fire Training and Certification	Yes	CONS-21	Funds will be used to train CRJMTC environmental staff in wildland fire management.	Forestry Reimbursable and ENV (Appropriation 2065, Master Cooperative Agreement)	Discontinued	Sikes Act, Army Regulation	2013	Ongoing	$0	NA	$0	Incomplete	Funds not requested pending update of IWFMP.
							2014	Ongoing	$0	NA	$0	Incomplete	Funds not requested pending update of IWFMP.
							2015	Ongoing	$0	NA	$0	Incomplete	Wildland Fire Training project discontinued and training requirement captured in general conservation staff training project for FY15 and beyond.
Stream Bank Stabilization	No	CONS-22	Funds will be used to stabilize and harden eroded stream banks of several streams where they exit at the training site.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430090008	CWA, Sikes Act, Army Regulation	2013	Ongoing	$30,000	Yes	$0	Incomplete	FY13 funds moved to higher priority range wetland permit project.
							2014	Ongoing	$30,000	No	$0	-	
							2015	Ongoing	$29,000	No	$0	-	
							2016	Ongoing	$29,900				
							2017	Ongoing	$30,800				
							2018	Ongoing	$31,700				
							2019	Ongoing	$34,600				
Wetland Delineation	Yes	CONS-23	Funds will be used to delineate wetlands in support of Camp Ravenna development projects and training missions.	Proponent Pays ENV (Appropriation 2065, Master Cooperative Agreement)	Various	CWA, Sikes Act, Army Regulation	2013	Ongoing	As Required	NA	See Comment	Complete	Included with MPMG and MRF Range wetland permit cost.
							2014	Ongoing		NA			
							2015	Ongoing		NA			
							2016	Ongoing					
							2017	Ongoing					
							2018	Ongoing					
							2019	Ongoing					
Wetland Mitigation	Yes	CONS-24	When avoidance is not possible, funds will be used to obtain CWA Sec 404 wetland fill permits and Sec 401 clean water certifications and to design and construct wetland mitigation projects.	Proponent Pays ENV (Appropriation 2065, Master Cooperative Agreement)	OH430100003	CWA, Sikes Act, Army Regulation	2013	Ongoing	$0	NA	$0	NA	
							2014	Ongoing	$560,000	Yes	$465,000	In Progress	MPMG & MRF Range wetland and Stream mitigation. MILCON project ENV paid.
							2015	Ongoing	$100,000	No			Request for FY15 to cover anticipated shortfall in FY15. Bid came in low enough to cover cost with FY14 funds.
							2016	Ongoing	$0				
							2017	Ongoing	$0				
							2018	Ongoing	$0				
							2019	Ongoing	$0				
Conservation Staff Training	Yes	CONS-25	Funds will be used to support travel and professional training for NR management staff.	ENV (Appropriation 2065, Master Cooperative Agreement)	OHB64060004	Sikes Act, Army Regulation	2013	Ongoing	$6,000	Yes	$0	Complete	Funding moved to other priorities.
							2014	Ongoing	$6,000	Yes	$1,015	Complete	Under obligated because funds not available until 3rd or 4th quarter.
							2015	Ongoing	$6,300	Yes			
							2016	Ongoing	$9,600				
							2017	Ongoing	$9,900				
							2018	Ongoing	$10,200				
							2019	Ongoing	$10,500				

Table 18. Implementation Projects 2013 - 2019*

Last Updated 18 December 2014

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to Previous INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Soil Management	No	CONS-26	Funds will be used to support protection and management of training site soils to include planning, erosion control, leveling, soil amendments, and re-vegetation to meet NPDES permit requires soils management goals of the INRMP.	ITAM, Facilities SRM, RTLP (Appropriation 2065, Master Cooperative Agreement)	NA	CWA, Sikes Act, Army Regulation	2013	Ongoing	$15,300	Yes	?	Complete	Put requirement on contractors and do some with in-house staff. Do not have visibility on ITAM and other expenses for this activity.
							2014	Ongoing	$20,000	Yes	?	Complete	Put requirement on contractors and do some with in-house staff. Do not have visibility on ITAM and other expenses for this activity.
							2015	Ongoing	$20,000	Yes			
							2016	Ongoing	$20,000				
							2017	Ongoing	$20,000				
							2018	Ongoing	$25,000				
							2019	Ongoing	$25,000				
Surface Water Quality Monitoring	NA	CONS-27	Funds will be used to implement USGS surface water quality monitoring recommendation to ensure training activity is not degrading surface water quality.	NA	OH430090009	NA	NA	Discontinued	$0	No	0		No regulatory driver to justify funding. Must have a permit that requires water monitoring to get funding. Project discontinued in 2010.
INRMP Update or Revision	Yes	CONS-28	Funds will be used for updates and major revisions to the INRMP as needed.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430060006	Sikes Act, Army Regulation	2013	Ongoing	$0	NA			
							2014	Ongoing	$0	NA			
							2015	Ongoing	$0	NA			
							2016	Ongoing	$0				
							2017	Ongoing	$0				
							2018	Ongoing	$22,500				Expect to update after 2017 Review for Operation and Affect.
							2019	Ongoing	$0				
Salaries for Conservation Staff	Yes	CONS-29	Funds will be used to pay the salaries and benefits of OHARNG conservation staff.	ENV (Appropriation 2065, Master Cooperative Agreement)	OHB64060002	Sikes Act, Army Regulation	2013	Ongoing	$197,300	Yes	$197,300	Complete	Natural Resources Manager added to State staff at beginning of FY15. Also includes Cultural Resources Manager and Environmental Supervisor.
							2014	Ongoing	$269,900	Yes	$269,888	Complete	
							2015	Ongoing	$297,000	Yes			
							2016	Ongoing	$305,000				
							2017	Ongoing	$314,000				
							2018	Ongoing	$324,000				
							2019	Ongoing	$333,000				
Wetland Mitigation Monitoring	Yes	CONS-30	Funds will be used for required wetland mitigation monitoring and reporting to regulatory agency.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430110004 OH430130002	Clean Water Act, Sikes Act, Army Regulation	2013	Ongoing	$24,000	Yes	$0	In Progress	Three years of fence line restoration monitoring funded EOY FY12. FY13 funds used for other needs.
							2014	Ongoing	$0	NA	$29,000	In Progress	Wetland mitigation monitoring for MPMG and MFR Ranges FY15-FY20. Did not anticipate the need in FY14. Able to fund partial requirement with available funds.
							2015	Ongoing	$10,000	Yes			MPMG and MRF Range mitigation monitoring addition plus $4,000 for fence line monitoring.
							2016	Ongoing	$23,000				MPMG and MRF Range mitigation monitoring addition plus $4,000 for fence line monitoring.
							2017	Ongoing	$21,000				MPMG and MFR Ranges additional need.
							2018	Ongoing	$12,000				MPMG and MFR Ranges additional need.
							2019	Ongoing	$16,000				MPMG and MFR Ranges additional need.

Table 18. Implementation Projects 2013 - 2019*

Last Updated 18 December 2014

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to Previous INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Wetland Fill Permitting	Yes	CONS-31	Funds will be used to contract wetland fill permitting for various training projects.	Proponent Pays ENV (Appropriation 2065, Master Cooperative Agreement)	OH43013004 Various	Clean Water Act, Army Regulation	2013	Ongoing	$26,000	Yes	$111,895.00	In Progress	Wetland fill permit for MPMG and MFR Ranges, MILCON. One permit for both range projects to include wetland and stream mitigation plans.
							2014	Ongoing	$0	NA			
							2015	Ongoing	$0	NA			
							2016	Ongoing	$0				
							2017	Ongoing	$0				
							2018	Ongoing	$0				
							2019	Ongoing	$0				
Young Forest Habitat Management	Yes	CONS-32	Funds will be used to manage designated Young Forest Habitat areas via periodic brush cutting and timber harvesting. Treated areas will be maintained on a 5-10 year cycle.	ENV (Appropriation 2065, Master Cooperative Agreement)	OH430150001	Sikes Act User Fees Appropriation 5095)	2013	Ongoing	$26,000	Yes	$25,989.50	In Progress	67.70ac treated in FY13 (State Contract). Included with grassland management project.
							2014	Ongoing	$0	No	0	-	Off year.
							2015	Ongoing	$0	NA			Separate STEP project created for FY15 and beyond.
							2016	Ongoing	$70,000				
							2017	Ongoing	$0				
							2018	Ongoing	$84,900				
							2019	Ongoing	$0				
Vegetation Management	No	SRM-1	Funds will be used to contract the herbicide applications and some mowing activities at Camp Ravenna.	Facilities SRM	NA	Sikes Act, Army Regulation, FIFRA	2013	Ongoing	$100,000	No	0		Not funded by facilities. Some in-house work done. Some work with FY12 funds.
							2014	Ongoing	$110,000	No			Not funded. Some in-house mowing.
							2015	Ongoing	$150,000	No			
							2016	Ongoing	$155,000				
							2017	Ongoing	$160,000				
							2018	Ongoing	$165,000				
							2019	Ongoing	$175,000				Is this project in STEP so I can see FY14 funding and FY19 projected funding?

*Anticipated projects needed to implement INRMP programs from FY13 through FY19. FY13 and FY14 projects were implemented while the updated INRMP and updated Table 18 were being compiled.

8.1.1.1 NGB/OHARNG FUNDING

Funding from the following NGB/OHARNG sources will be required to implement the INRMP over the next five years.

The NGB is the primary source of funding to support the management of natural resources at Camp Ravenna through a master cooperative agreement with the OHARNG. A budget of this type is managed by the Environmental Program Manager in Columbus. The NGB provides funding for salaries, natural resource surveys, environmental monitoring projects, and compliance-related projects.

A five-year ITAM Work Plan is used to channel ITAM funding requests from the OHARNG, through NGB, to the U.S. Army's Office of the Deputy Chief of Staff for Operations (ODCSOPS). The annual ITAM Work Plan is the basis for identifying installation ITAM resource requirements and for allocating funding to support installation core capabilities. ITAM funds can not be used for:

- correcting environmental statutory compliance requirements;
- performing routine range maintenance, modifications, or Sustainment, Restoration, and Maintenance (SRM) responsibilities;
- performing Army Conservation Program requirements, such as Planning Level Surveys; and
- adding additional GIS data layers that are not a part of the ITAM requirement (DA, 2005).

The NGB Army Installations Division provides funding for personnel, equipment and supplies in support of the OHARNG Facilities Management Office. This office is involved in planning, scheduling, and oversight of maintenance of roads and trails, vegetation management, pest management, facilities infrastructure, construction, and master planning, all of which impact, and are impacted by, the natural resources management program.

In accordance with the Sustainable Range/Installation Environmental Activities Matrix (Phase 1) facilities funds pest and noxious weed control, invasive species control, facilities vegetation control and controlled burns to manage vegetation and fuels on training areas and ranges. Conservation identifies, monitors, and plans management of invasive species and noxious weeds and funds controlled burns done for ecological conservation purposes.

Forest management activities are funded from operation funds, forestry reimbursable funds, and the DoD Forestry Reserve Account.

Wildlife and wildlife habitat management activities are funded by the collection of user fees, which are deposited into the Camp Ravenna Fish and Wildlife Reimbursable Account.

Camp Ravenna INRMP projects and activities are currently 100% funded by ENV fund under the Master Cooperative Agreement (MCA) and reimbursable account funds.

8.1.1.2 OTHER FEDERAL FUNDS

Cooperative agreements may be entered with states, local governments, non-governmental organizations, and individuals for the improvement of natural resources or to benefit natural and historical research on federally owned training sites. Upon written concurrence of the Camp Ravenna INRMP by the USFWS and the ODNR, these agencies become signatory cooperators of this plan. As such, the potential for access to matching funds programs and services offered by these agencies will be available.

Program initiatives under the CWA provide funding through several sources. The USEPA's Office of Water sponsors those projects related to the CWA. Available funding may support programs such as cost-sharing for overall water-quality management (for example, monitoring, permitting, and enforcement), lake water quality assessments and mitigation measures, and implementation of non-point source pollution control measures. Refer to the USEPA's Office of Water funding website for potential sources of funding http://www.epa.gov/water/funding.html.

The Legacy Resource Management Program provides financial assistance to DoD efforts to conserve natural and cultural resources on Federal lands. Legacy projects could include regional ecosystem management initiatives, habitat preservation efforts, archeological investigations, invasive species control, and/or flora or fauna surveys. Legacy funds are awarded based on national visibility. Project proposals are submitted to the program.

8.1.1.3 NON-FEDERAL FUNDS

Other funding sources that could be considered include The Public Lands Day Program, which coordinates volunteers to improve the public lands they use for recreation, education, and enjoyment, and the National Environmental Education & Training Foundation, which manages, coordinates, and generates financial support for the program.

8.1.1.4 SOIL AND PLANT CONSERVATION FUNDING

The NRCS manages the Federal Domestic Assistance Program (Plant Materials for Conservation) that assembles, evaluates, selects, releases, and introduces into commerce and promotes the use of new and improved plant materials for soil, water, and related resource conservation and environmental improvement programs.

8.1.2 PRIORITIES AND SCHEDULING

The STEP database will be used to validate projects funded with ENV MCA funds and determine funding priority. Projects need to be funded consistent with timely execution to meet future deadlines. Projects are generally prioritized with respect to compliance. Highest priority projects are projects related to recurring or current compliance, and these are generally scheduled earliest. The Camp Ravenna projects and schedules are listed in Table 18.

Recurring requirements include projects and activities needed to cover the recurring administrative, personnel and other costs that are necessary to meet applicable compliance requirements (Federal and State laws, regulations, Presidential EOs, and DoD policies) or which are in direct support of the military mission. Recurring costs include manpower, training, supplies; hazardous waste disposal; operating recycling activities; permits and fees; testing, monitoring and/or sampling and analysis; reporting and record keeping; maintenance of environmental conservation equipment; and, compliance self-assessments.

Current compliance includes projects and activities needed because an installation is currently or will be out of compliance if projects or activities are not implemented in the current program year. Examples include:

- Environmental analyses, monitoring, and studies required to assess and mitigate potential effects of the military mission on conservation resources;
- Planning documents;
- Baseline inventories and surveys of natural and cultural resources (historical and archaeological sites);
- Biological assessments, surveys, or habitat protection for a specific listed species;
- Mitigation to meet existing regulatory permit conditions or written agreements;
- Wetland delineations in support of subsequent jurisdictional determinations and consequent permitting;
- Efforts to achieve compliance with requirements that have deadlines that have already passed; and
- Initial documenting and cataloging of archaeological materials.

Maintenance requirements include those projects and activities needed that are not currently out of compliance but shall be out of compliance if projects or activities are not implemented in time to meet an established deadline beyond the current program year. Examples include:

- Compliance with future requirements that have deadlines;
- Conservation and GIS mapping to be in compliance;
- Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives;
- Wetlands enhancement, in order to achieve the Executive order for "no net loss" or to achieve enhancement of existing degraded wetlands; and
- Public education programs that educate the public on the importance of protecting archaeological and natural resources.

Lower priority project include those that enhance conservation resources of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required under regulation or EO and are not of an immediate nature. These projects are generally funded after those of higher priority are funded. Examples include:

- Community outreach activities, such as "Earth Day" and "Historic Preservation Week" activities;
- Educational and public awareness projects, such as interpretive displays, oral histories, "Watchable Wildlife" areas, nature trails, wildlife checklists, and conservation teaching materials;
- Biological assessments, surveys, or habitat protection for a species;
- Restoration or enhancement of cultural or natural resources when no specific compliance requirement dictates a course or timing of action;
- Re-interment of Native American remains on DoD managed or controlled land; and
- Management and execution of volunteer and partnership programs.

8.2 NATURAL RESOURCES MANAGEMENT STAFFING AND TRAINING

Natural resources program oversight and INRMP implementation are located at Camp Ravenna and at Beightler Armory in Columbus, Ohio.

Training for OHARNG personnel, as well as others participating in the management of natural resources, should be practical and job-related. All training programs should involve at minimum a review of legal compliance requirements, applicable DoD/DA regulations, pertinent State and local laws, and current scientific and professional standards as related to the conservation of natural resources. The following annual workshops, professional conferences, and classes are excellent means of obtaining interdisciplinary training for natural resources managers:

- Army National Guard National Environmental Workshop (NEW)
- North American Wildlife and Natural Resources Conference http://www.wildlifemanagementinstitute.org/pages/main.html;
- Defense Environmental Network Information Exchange (DENIX) http://www.denix.mil/;
- Army Training Support Center - http://www.atsc.army.mil/;
- Department of the Army Annual Forestry Workshop;
- Ohio Pesticide Applicator Certification Training;
- National Military Fish and Wildlife Association - http://www.nmfwa.org/;

- USACE Wetland Delineation Courses - http://www.hnd.usace.army.mil/to/pindex.html; and
- Locally available training through the Cooperative Extension Service, universities, professional and trade organizations, State government, and commercial businesses.

Conferences and workshops will be evaluated for their usefulness, and decisions will be made based on appropriateness to ongoing projects and funding availability. Personnel will be trained in related environmental fields, as appropriate. NEPA training will be required of all supervisory personnel and those who review or prepare NEPA documents.

8.3 INRMP REVIEWS

8.3.1 REVIEW FOR OPERATION AND EFFECT

Not less than every five years, the INRMP will be reviewed for operation and effect to determine if the INRMP is being implemented to meet the requirements of the Sikes Act and contributing to the conservation and rehabilitation of natural resources at Camp Ravenna. The review will be conducted by the three cooperating parties to include the commander responsible for the INRMP, the Regional Director of the USFWS, and Director of the ODNR. These agencies all have technical representatives who actually do the review.

The review for operation and effect will either conclude that the INRMP is meeting the intent of the Sikes Act and it can be updated and implementation can continue, or that it is not effective in meeting the intent of the Sikes Act to conserve natural resources while providing for no net loss in training capability and it must be revised. The conclusion of the review will be documented in a jointly executed memorandum, meeting minutes, or in some other way that reflects mutual agreement.

If only minor updates are needed, they will be done in a manner agreed to by all parties. The updated INRMP will be reviewed by the local USFWS office, USFWS Regional Director, the ODNR DOW, and ODNR Director and once concurrence letters or signatures are received from USFWS Regional Director and the ODNR Director, the INRMP will continue to be implemented. A new NEPA review is not necessary for an update and the continued implementation of an existing INRMP that has previously undergone NEPA review. In this case, an Environmental Checklist and REC citing the previous NEPA document is needed.

If a review of operation and effect concludes that an INRMP must be revised, there is no set time to complete the revision. The existing INRMP remains in effect until the revision is complete and USFWS and ODNR concurrence on the revised INRMP is received. The OHARNG will endeavor to complete such revisions within 18 months depending upon funding availability. Revisions to the INRMP will go through a more detailed review process similar to development of the initial INRMP to ensure OHARNG military mission, USFWS, and ODNR concerns are adequately addressed and the plan meets the intention of the Sikes Act. Revisions will usually require a new NEPA analysis. An Environmental Assessment will be done as part of the revision process if determined by NGB to be necessary.

8.3.2 ANNUAL REVIEWS AND COORDINATION

Per DoD policy, the OHARNG will review the INRMP annually in cooperation with the USFWS and ODNR. On an annual basis the OHARNG will invite the USFWS Regional Office, the USFWS local field office, the ODNR, the ODNR DOW, and NGB to attend a meeting at Camp Ravenna to review previous year INRMP implementation and discuss implementation of upcoming programs and projects. Invitations will either be by letter or email. Attendance is at the option of those invited, but at minimum the USFWS local field office and ODNR DOW are expected to attend. The meeting will be documented with an agenda, meeting minutes and sign in roster of attendees.

At this annual meeting the need for updates or revisions will be discussed. If minor updates are needed, the requesting party will initiate the updates and after agreement of all three parties they will be added to the INRMP. If it is determined that major changes are needed, all three parties will provide input and an INRMP revision and associated NEPA review will be initiated with the OHARNG acting as the lead coordinating agency. The annual meeting will be used to help expedite the more formal review for

operation and effect and if all parties agree and document their mutual agreement, it can fulfill the requirement to review the INRMP for operation and effect.

If not already determined in previous annual meetings, by the forth year annual review a determination will be jointly made to continue implementation of the existing INRMP with minor updates or to proceed with a revision. If the parties feel that the annual reviews have not been sufficient to evaluate operation and effect and they cannot determine if the INRMP implementation should continue or be revised, a formal review for operation and effect will be initiated. The determination on how to proceed with INRMP implementation or revision will be made after the parties have had time to complete this review.

In accordance with the Army Guidance for Implementation of the SAIA, dated May 25, 2006, and ARNG-ILE guidance, dated 9 April 2012, annual reviews shall at minimum verify that:

- Current information on INRMP conservation metrics as described in AEDB-EQ is available.
- All "must fund" projects and activities have been budgeted for and implementation is on schedule.
- All required trained natural resources positions are filled or are in the process of being filled.
- Projects and activities for the upcoming year have been identified and included in the INRMP. An updated project list does not necessitate revising the INRMP.
- All required coordination has occurred.
- All significant changes to the installation's mission requirements or its natural resources have been identified.
- The INRMP goals and objectives are still valid.
- No net loss of training capability has occurred due to implementation of the INRMP in accordance with the Sikes Act.

As part of the annual review the OHARNG will specifically:

- Invite feedback from the USFWS and ODNR DOW on the effectiveness of the INRMP;
- Inform the USFWS and ODNR DOW which INRMP projects and activities are required to meet current natural resources compliance needs; and
- Document specific INRMP action accomplishments from the previous year.

Information for the annual reviews comes from the OHARNG environmental staff, Camp Ravenna military leadership, cooperating agencies, project files, and Army Environmental Database Environmental Quality (AEDB-EQ) as applicable. Natural resources data and program and project information are available to cooperating agencies. They may request to see project folders or to have a site visit to view natural resources projects in progress at any time.

8.4 MONITORING INRMP IMPLEMENTATION

8.4.1 CAMP RAVENNA INRMP IMPLEMENTATION MONITORING

Monitoring of INRMP implementation is necessary to facilitate the legal requirements of the SAIA to review for operation and effect. **Section 8.0** lists the implementation requirements given in the DA Guidance for Implementation of the SAIA, dated 25 May 2006 and ARNG-ILE guidance, dated 9 April 2012. An INRMP is considered implemented in regard to the SAIA if the requirements in the Army guidance are met. These SAIA implementation criteria do not necessarily measure the effectiveness of an INRMP in facilitating mission accomplishment while conserving natural resources. Camp Ravenna INRMP implementation will be monitored for meeting the legal requirements of the SAIA as well as for other mission and biological measures of effectiveness.

The ultimate successful implementation of this INRMP is realized in no net loss in the capability of Camp Ravenna training lands to support the military mission while at the same time conserving and rehabilitating natural resources found on the training site. Initiation of projects is one measure that is used to monitor INRMP implementation, but it does not give the total picture of the effectiveness of the natural resources management program. Natural resources management is not the sum total of projects, interagency coordination or program funding and staffing. Natural resources management at Camp Ravenna is a program and a philosophy that guides the OHARNG's approach to land use. A lot of the INRMP implementation is done through internal coordination in regard to training site operations and land use decision making. This type of implementation can not be measured by project implementation or funding levels. It is evidenced by such things as the ability to continually train, sustainable land use, on going regulatory compliance, retention of species diversity, retention of surface water quality, and the acknowledgement of sustainable natural resources management by partnering conservation agencies and other interested organizations and individuals.

In order to monitor and evaluate the effectiveness of the INRMP implementation the following will be reviewed as applicable and discussed within the context of the annual review and/or a formal review of operation and effect:

- Impacts to/from the military mission;
- Conservation program budget;
- Staff requirements;
- Program and project implementation;
- Trends in species and habitat diversity as evidenced by recurring biological surveys, land use changes, and opinions of natural resource managers;
- Compliance with regulatory requirements; and
- Feedback from military trainers, the USFWS, the ODNR, and others.

Some of these areas may not be looked at every year due to lack of data or pertinent information. The effectiveness of the INRMP as a mission enabling conservation tool will be decided by mutual agreement of the USFWS, the ODNR, and the OHARNG during annual reviews and / or reviews for operation and effect.

8.4.2 DEPARTMENT OF THE ARMY INRMP IMPLEMENTATION MONITORING

The Army uses the Environmental Quality Report (EQR) to monitor SAIA compliance throughout the department. EQR is the automated system used to collect installation environmental information for reporting to DoD and Congress. The EQR system moved to the Army Environmental Reporting Online (AERO) portal in February 2005, creating a day-to day management tool. The AEDB-EQ module is a full update of the Web-based software EQR application used to convey the Army's environmental status to senior Army leadership, DoD, and Congress since 1997.

Established to fulfill a semi-annual requirement to report the status of DoD's Environmental Quality program to Congress, EQR collects information on enforcement actions, inspections and other performance measures for high-level reports and quarterly reviews. EQR also helps the Army track fulfillment of DoD Measures of Merit requirements.

The module is designed to coordinate information management for conservation, compliance, pollution prevention and other Army environmental reporting. It can adapt easily to future changes in command structure or measures of merit. AEDB-EQ provides for the collection, review, and retrieval of data in 14 program areas, from enforcement actions to conservation program metrics. The Environmental Program Requirements (EPRWeb) reporting system is a module of AEDB.

The DUSD *Updated Guidance for Implementation of The SAIA* updated Conservation Metrics for Preparing and Implementing INRMPs. Progress toward meeting these measures of merit is reported in the annual EQR to Congress. Reporting requirements include:

- The installation name and state. The year the most recent INRMP was completed or revised.
- Date planned for the next revision.
- Was the INRMP coordinated with appropriate military trainers and operators?
- Were projects added to the INRMP as a result of comments from military trainers and operators?
- Were segments of the INRMP concerning the conservation, protection and management of fish and wildlife resources agreed to by the USFWS Regional Director?
- Were projects added to the INRMP as a result of USFWS comments?
- Has annual feedback been requested from the USFWS?
- Has annual feedback been received from the USFWS?
- Were segments of the INRMP concerning the conservation, protection and management of fish and wildlife resources agreed to by the State fish and wildlife agency Director? (State coordination)
- Were projects added to the INRMP as a result of State comments?
- Has annual feedback been requested from the State fish and wildlife agency?
- Has annual feedback been received from the State fish and wildlife agency?
- Does the INRMP contain a list of projects necessary to meet plan goals and objectives, as well as timeframes for implementation of any such projects?
- $ spent in reporting FY to implement the INRMP.
- Did the installation seek public comment on the draft INRMP?
- Were projects added to the INRMP as a result of public comments?

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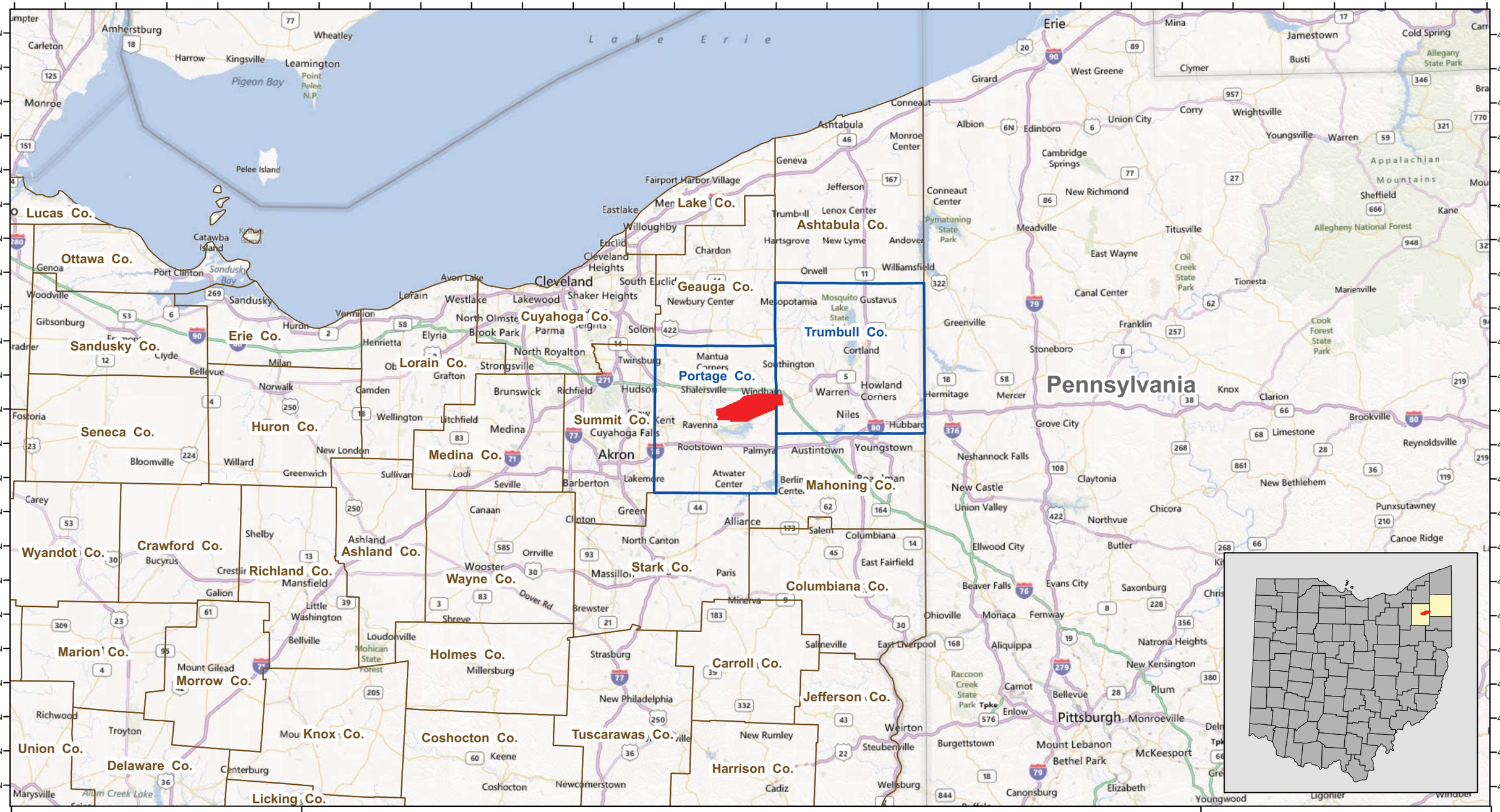


Figure 1. Site Location Map
Camp Ravenna Joint Military Training Center

Camp Ravenna Boundary

Portage and Trumbull Counties

Ohio Counties

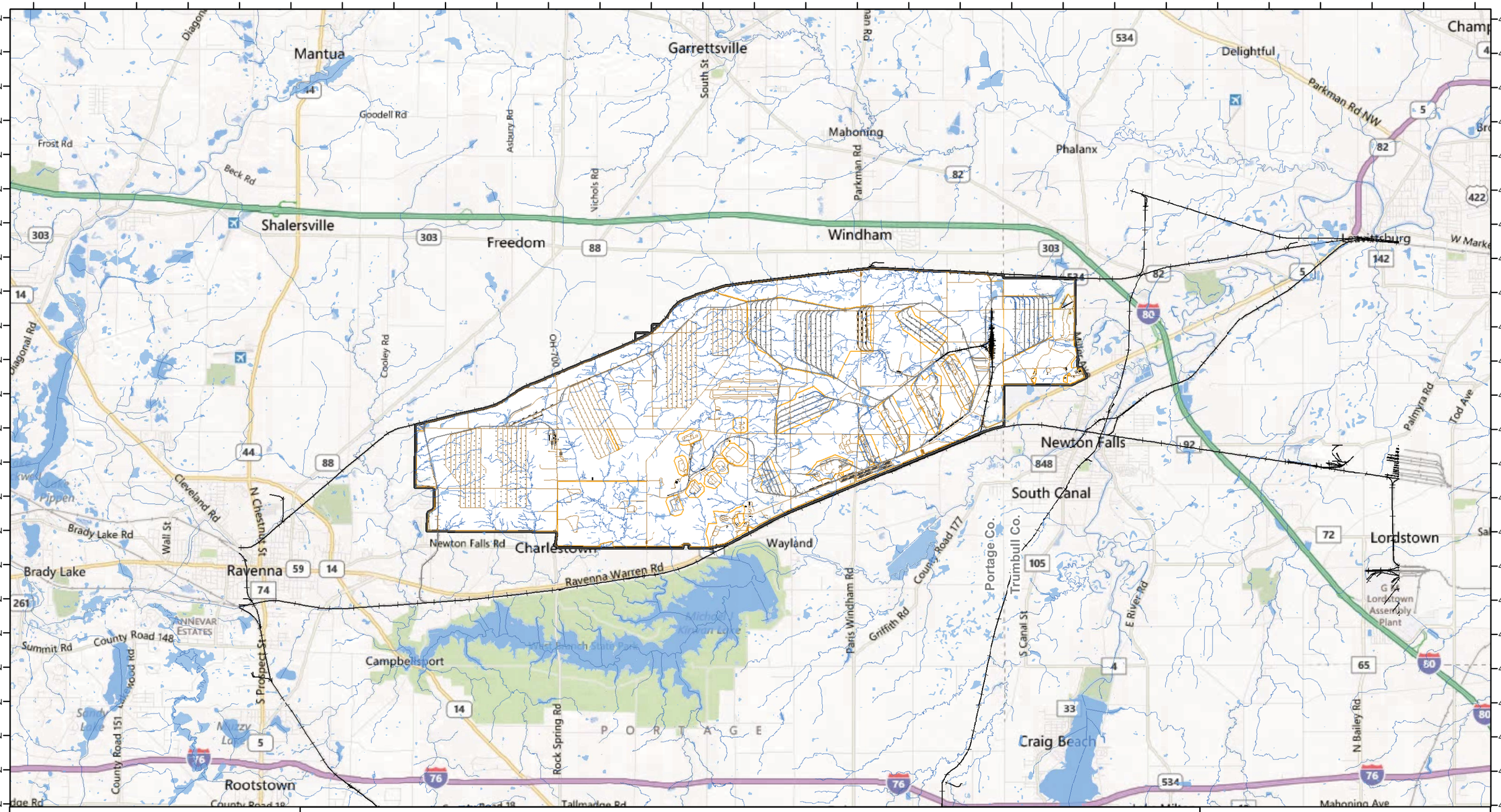
Base map courtesy of Bing Maps. Spatial Data courtesy of OHARNG. Projection: WGS84 UTM Zone 17N

Date: 8/14/2013

No warranty is made by the OHARNG/ARNG as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. This map is a "living document", in that it is intended to change as new data become available and is incorporated into the Enterprise GIS database.

Ohio Army National Guard

ARNG Training Center Garrison Command



2 1 0 2 Miles

3,000 1,500 0 3,000 Meters

Ohio Army National Guard

Figure 2. Area Map
Camp Ravenna Joint Military Training Center

Road/Trail
Fence
Active Railroad
Inactive Railroad
Creek/Stream
Waterbody
Building
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013

ARNG Training Center
Garrison Command

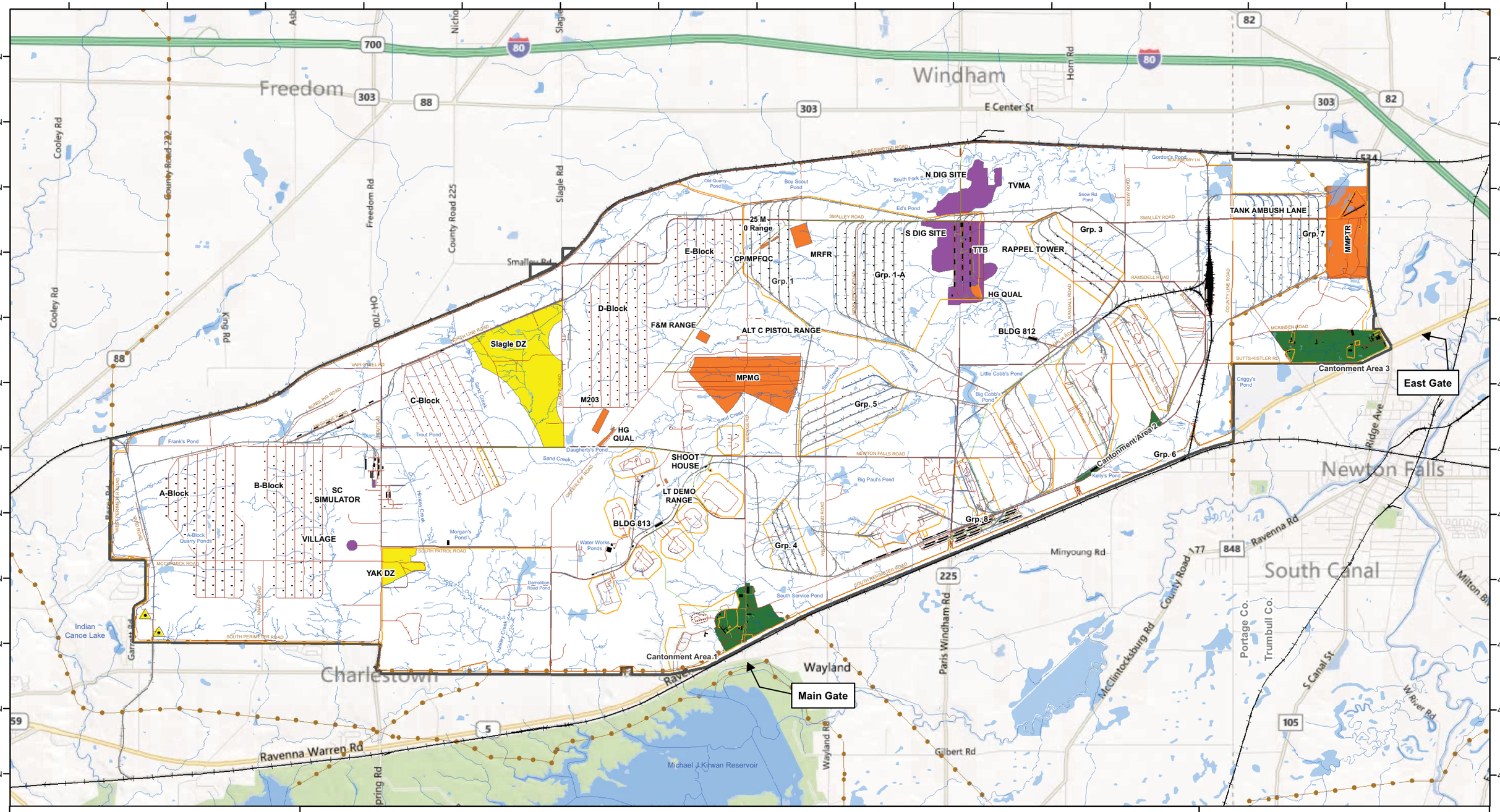


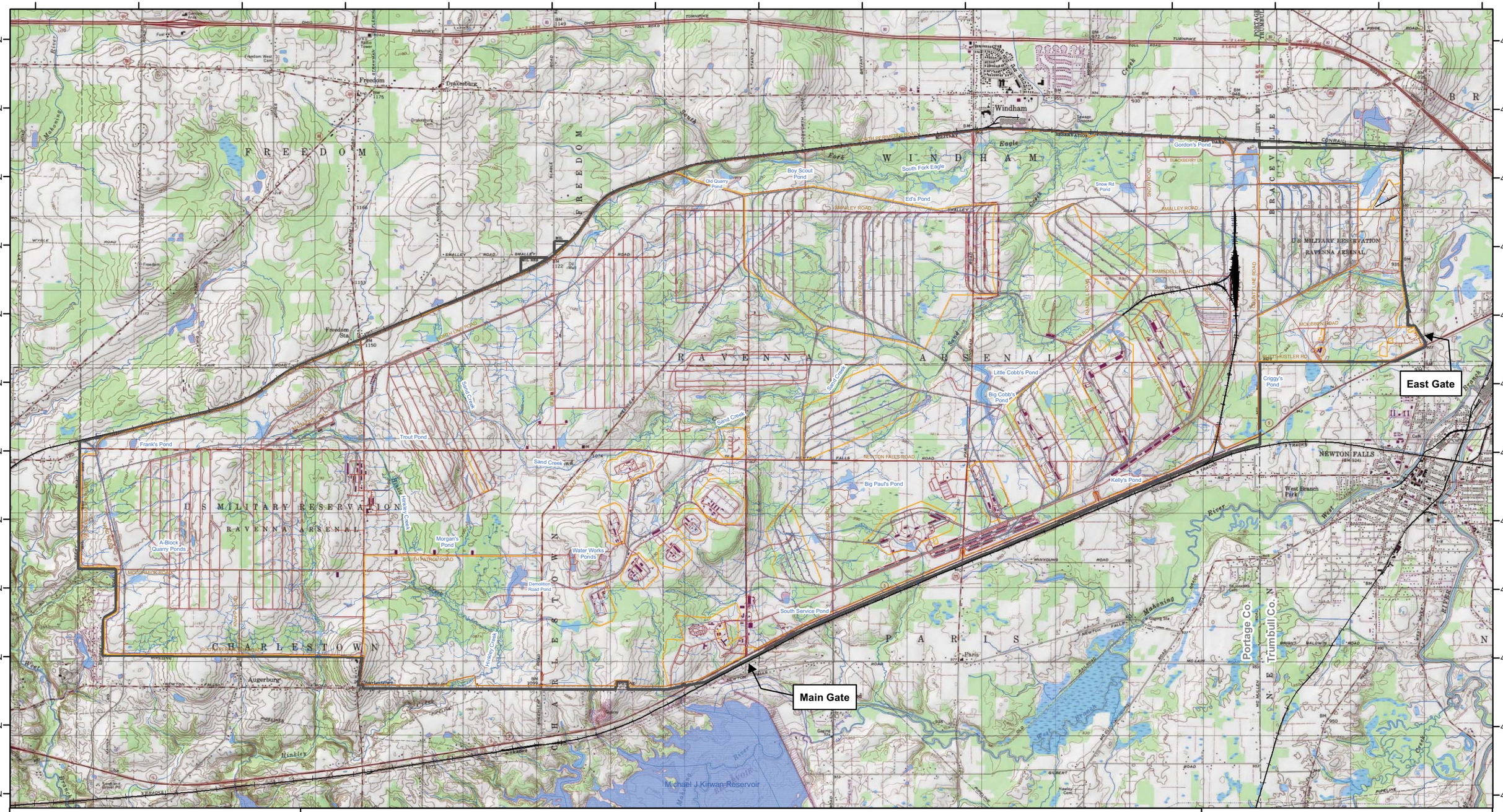
Figure 3. Installation Map and Facilities
Camp Ravenna Joint Military Training Center

Oil Well
Above Ground Electrical Line
Fence
Road/Trail
Active Railroad
Inactive Railroad
Pipeline
Creek/Stream
Waterbody
Building
Military Range Area
Cantonment Area
Drop Zone
Training Venue
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013

Ohio Army National Guard

ARNG Training Center
Garrison Command



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 4a. Topographic Map
Camp Ravenna Joint Military Training Center

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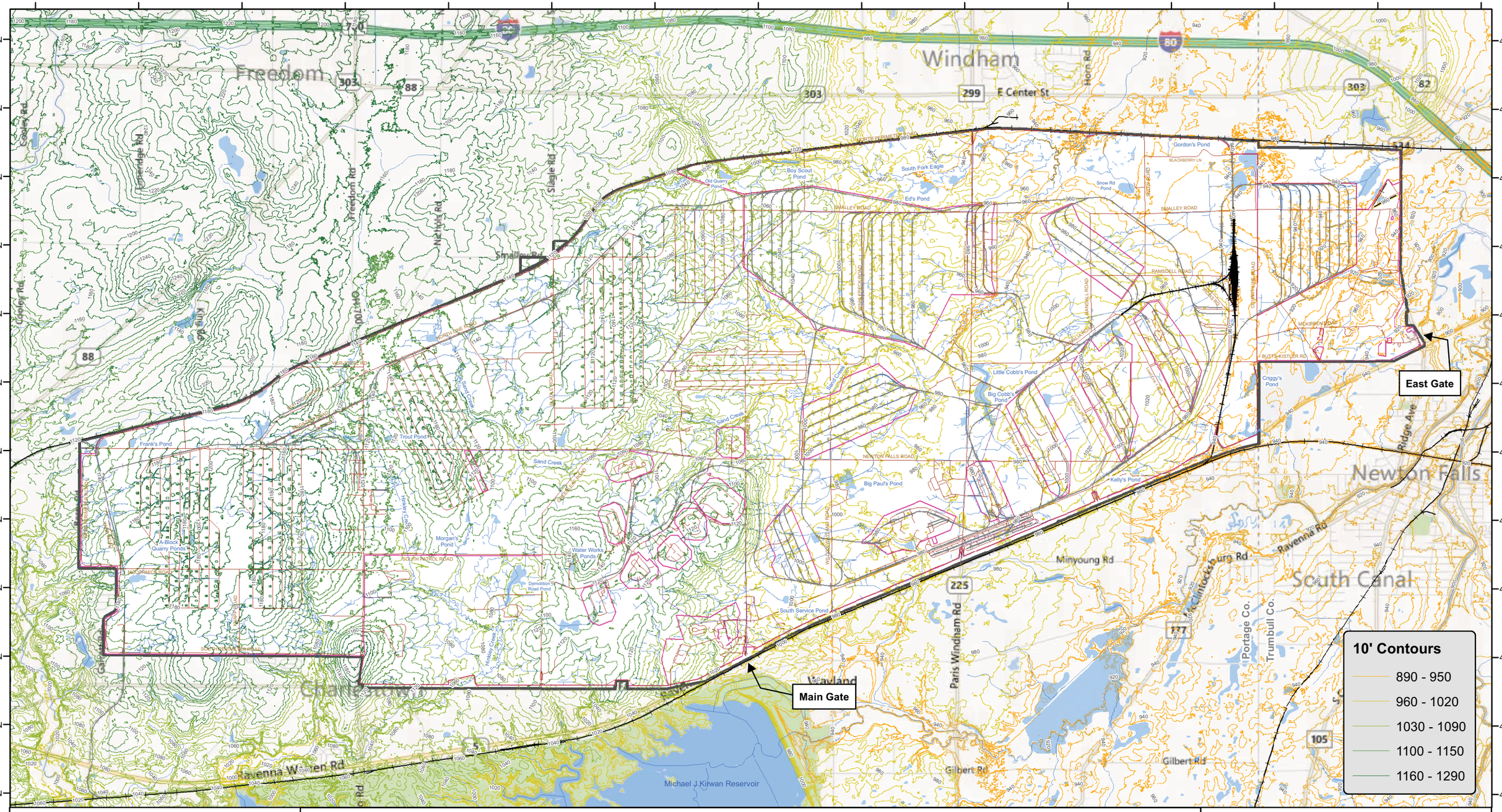
Ohio Army National Guard

ARNG Training Center
Garrison Command

- Above Ground Electrical Line
- Fence
- Road/Trail
- Creek/Stream
- Active Railroad
- Inactive Railroad
- Waterbody
- Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/21/2013



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 4b. Contour Map
Camp Ravenna Joint Military Training Center

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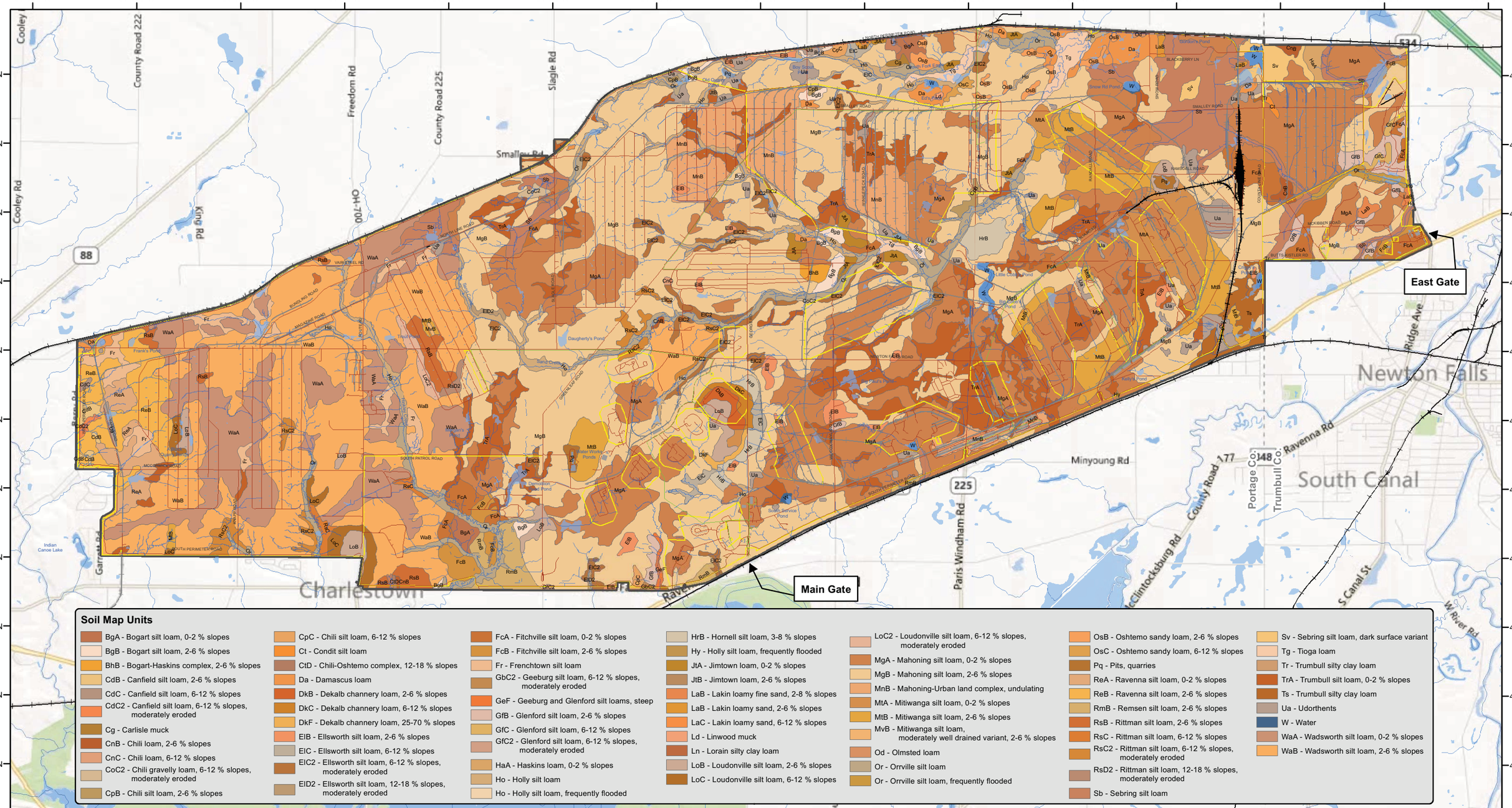
Ohio Army National Guard

ARNG Training Center
Garrison Command

- Above Ground Electrical Line
- Fence
- Road/Trail
- Creek/Stream
- Active Railroad
- Inactive Railroad
- Waterbody
- Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG, OSIP, and USGS. Projection: WGS84 UTM Zone 17N Date: 8/21/2013



Soil Map Units

- BgA - Bogart silt loam, 0-2 % slopes
- BgB - Bogart silt loam, 2-6 % slopes
- BhB - Bogart-Haskins complex, 2-6 % slopes
- CdB - Canfield silt loam, 2-6 % slopes
- CdC - Canfield silt loam, 6-12 % slopes
- CdC2 - Canfield silt loam, 6-12 % slopes, moderately eroded
- Cg - Carlisle muck
- CnB - Chili loam, 2-6 % slopes
- CnC - Chili loam, 6-12 % slopes
- CoC2 - Chili gravelly loam, 6-12 % slopes, moderately eroded
- CpB - Chili silt loam, 2-6 % slopes
- CpC - Chili silt loam, 6-12 % slopes
- Ct - Condit silt loam
- CtD - Chili-Oshtemo complex, 12-18 % slopes
- Da - Damascus loam
- DkB - Dekalb channery loam, 2-6 % slopes
- DkC - Dekalb channery loam, 6-12 % slopes
- DkF - Dekalb channery loam, 25-70 % slopes
- ElB - Ellsworth silt loam, 2-6 % slopes
- ElC - Ellsworth silt loam, 6-12 % slopes
- ElC2 - Ellsworth silt loam, 6-12 % slopes, moderately eroded
- ElD2 - Ellsworth silt loam, 12-18 % slopes, moderately eroded
- FcA - Fitchville silt loam, 0-2 % slopes
- FcB - Fitchville silt loam, 2-6 % slopes
- Fr - Frenchtown silt loam
- GbC2 - Geeburg silt loam, 6-12 % slopes, moderately eroded
- GeF - Geeburg and Glenford silt loams, steep
- GfB - Glenford silt loam, 2-6 % slopes
- GfC - Glenford silt loam, 6-12 % slopes
- GfC2 - Glenford silt loam, 6-12 % slopes, moderately eroded
- HaA - Haskins loam, 0-2 % slopes
- Ho - Holly silt loam
- Ho - Holly silt loam, frequently flooded
- HrB - Hornell silt loam, 3-8 % slopes
- Hy - Holly silt loam, frequently flooded
- JtA - Jimtown loam, 0-2 % slopes
- JtB - Jimtown loam, 2-6 % slopes
- LaB - Lakin loamy fine sand, 2-8 % slopes
- LaB - Lakin loamy sand, 2-6 % slopes
- LaC - Lakin loamy sand, 6-12 % slopes
- Ld - Linwood muck
- Ln - Lorain silty clay loam
- LoB - Loudonville silt loam, 2-6 % slopes
- LoC - Loudonville silt loam, 6-12 % slopes
- LoC2 - Loudonville silt loam, 6-12 % slopes, moderately eroded
- MgA - Mahoning silt loam, 0-2 % slopes
- MgB - Mahoning silt loam, 2-6 % slopes
- MnB - Mahoning-Urban land complex, undulating
- MtA - Mitiwanga silt loam, 0-2 % slopes
- MtB - Mitiwanga silt loam, 2-6 % slopes
- MvB - Mitiwanga silt loam, moderately well drained variant, 2-6 % slopes
- Od - Olmsted loam
- Or - Orrville silt loam
- Or - Orrville silt loam, frequently flooded
- OsB - Oshtemo sandy loam, 2-6 % slopes
- OsC - Oshtemo sandy loam, 6-12 % slopes
- Pq - Pits, quarries
- ReA - Ravenna silt loam, 0-2 % slopes
- ReB - Ravenna silt loam, 2-6 % slopes
- RmB - Remsen silt loam, 2-6 % slopes
- RsB - Rittman silt loam, 2-6 % slopes
- RsC - Rittman silt loam, 6-12 % slopes
- RsC2 - Rittman silt loam, 6-12 % slopes, moderately eroded
- RsD2 - Rittman silt loam, 12-18 % slopes, moderately eroded
- Sb - Sebring silt loam
- Sv - Sebring silt loam, dark surface variant
- Tg - Tioga loam
- Tr - Trumbull silty clay loam
- TrA - Trumbull silt loam, 0-2 % slopes
- Ts - Trumbull silty clay loam
- Ua - Udorthents
- W - Water
- WaA - Wadsworth silt loam, 0-2 % slopes
- WaB - Wadsworth silt loam, 2-6 % slopes

1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

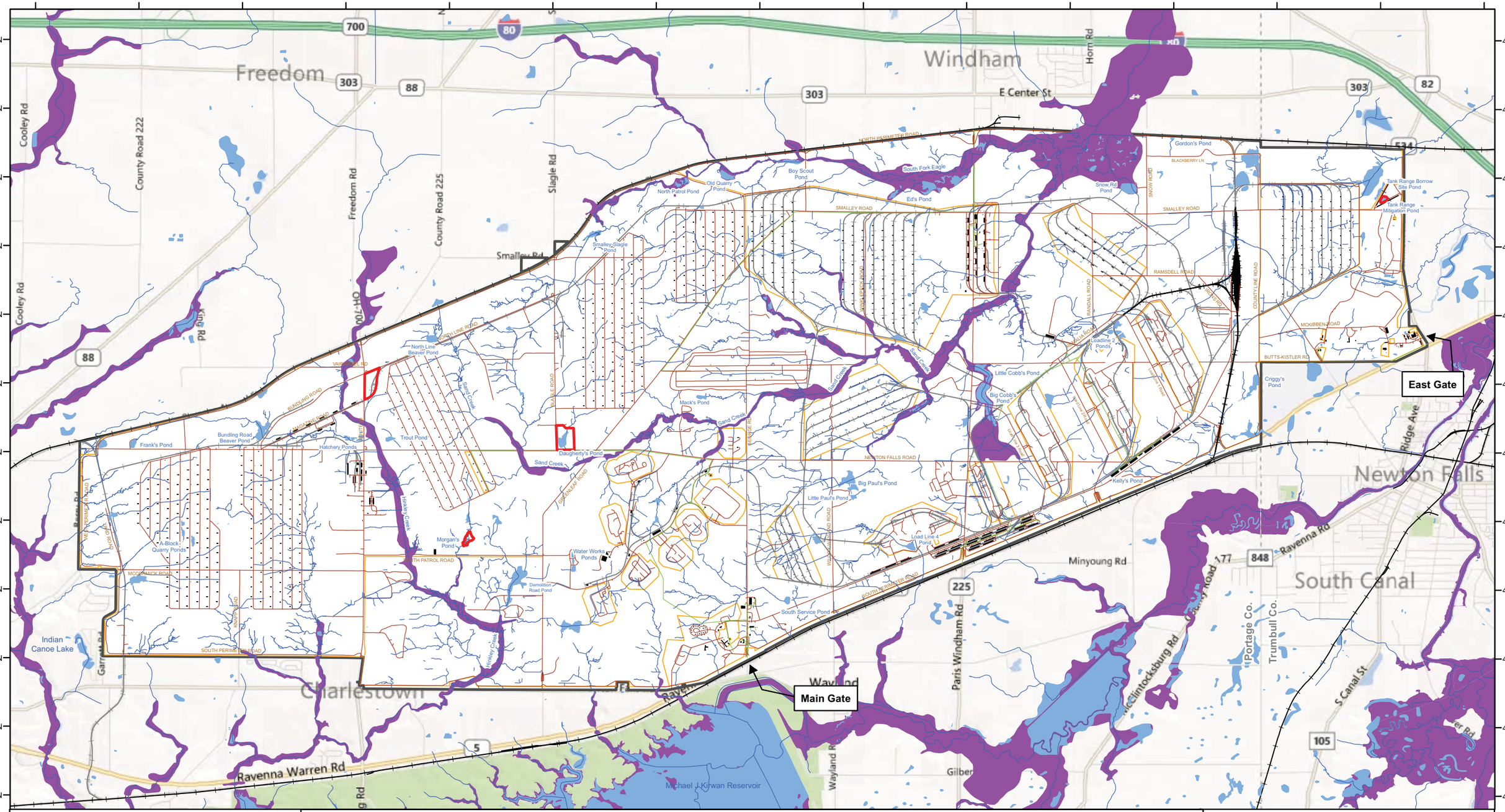
Ohio Army National Guard

Figure 5. Soil Classification
Camp Ravenna Joint Military Training Center

- Above Ground Electrical Line
- Road/Trail
- Fence
- Active Railroad
- Inactive Railroad
- Creek/Stream
- Waterbody
- Building
- Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG, SSURGO and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013

ARNG Training Center
Garrison Command



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 6. Surface Water
Camp Ravenna Joint Military Training Center

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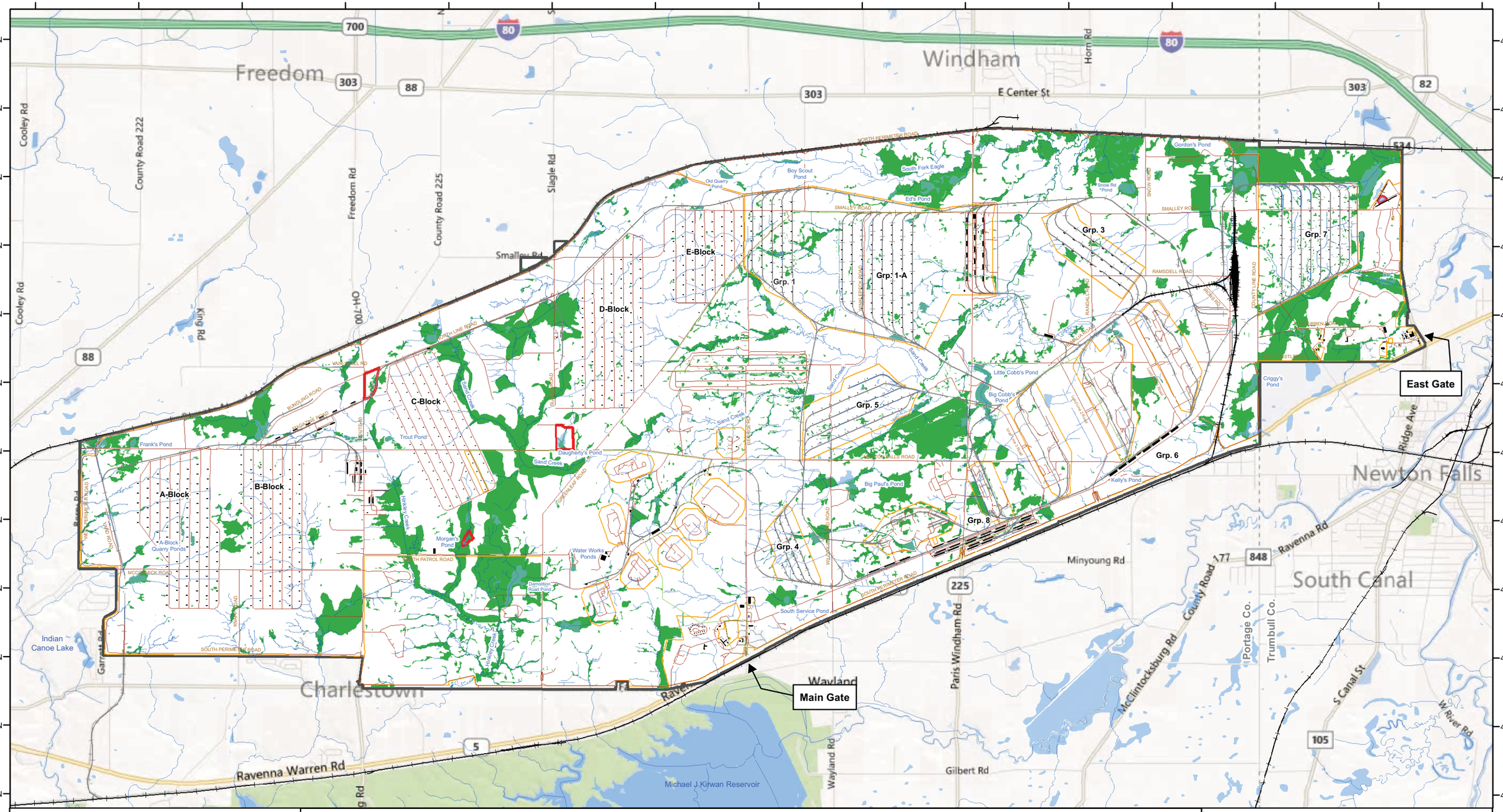
Above Ground Electrical Line
Fence
Active Railroad
Inactive Railroad
Road/Trail
Creek/Stream
Waterbody
Building
100-year Flood Zone
Wetland Mitigation Site
Camp Ravenna Boundary

Ohio Army National Guard

ARNG Training Center
Garrison Command

Basemap courtesy of Bing Maps. Spatial Data courtesy of FEMA, OHARNG, and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

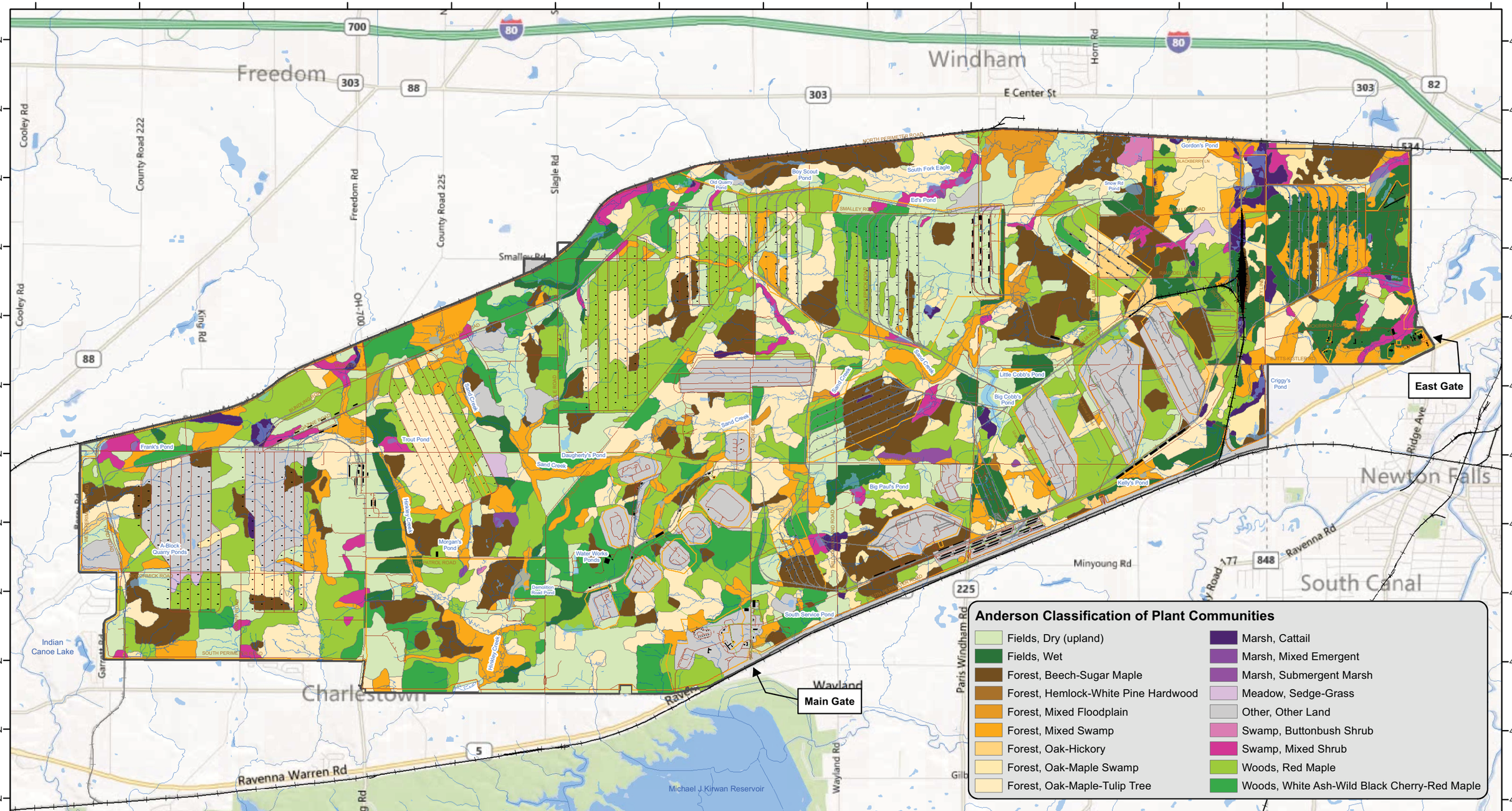
Ohio Army National Guard

Figure 7. Surveyed Wetlands
Camp Ravenna Joint Military Training Center

- Above Ground Electrical Line
- Fence
- Road/Trail
- Active Railroad
- Inactive Railroad
- Creek/Stream
- Wetland Mitigation Site
- Wetland (approx. 3,070 acres)
- Waterbody
- Building
- Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013

ARNG Training Center
Garrison Command



Anderson Classification of Plant Communities

- Fields, Dry (upland)
- Fields, Wet
- Forest, Beech-Sugar Maple
- Forest, Hemlock-White Pine Hardwood
- Forest, Mixed Floodplain
- Forest, Mixed Swamp
- Forest, Oak-Hickory
- Forest, Oak-Maple Swamp
- Forest, Oak-Maple-Tulip Tree
- Marsh, Cattail
- Marsh, Mixed Emergent
- Marsh, Submergent Marsh
- Meadow, Sedge-Grass
- Other, Other Land
- Swamp, Buttonbush Shrub
- Swamp, Mixed Shrub
- Woods, Red Maple
- Woods, White Ash-Wild Black Cherry-Red Maple

1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 8. Plant Communities (Anderson)
Camp Ravenna Joint Military Training Center

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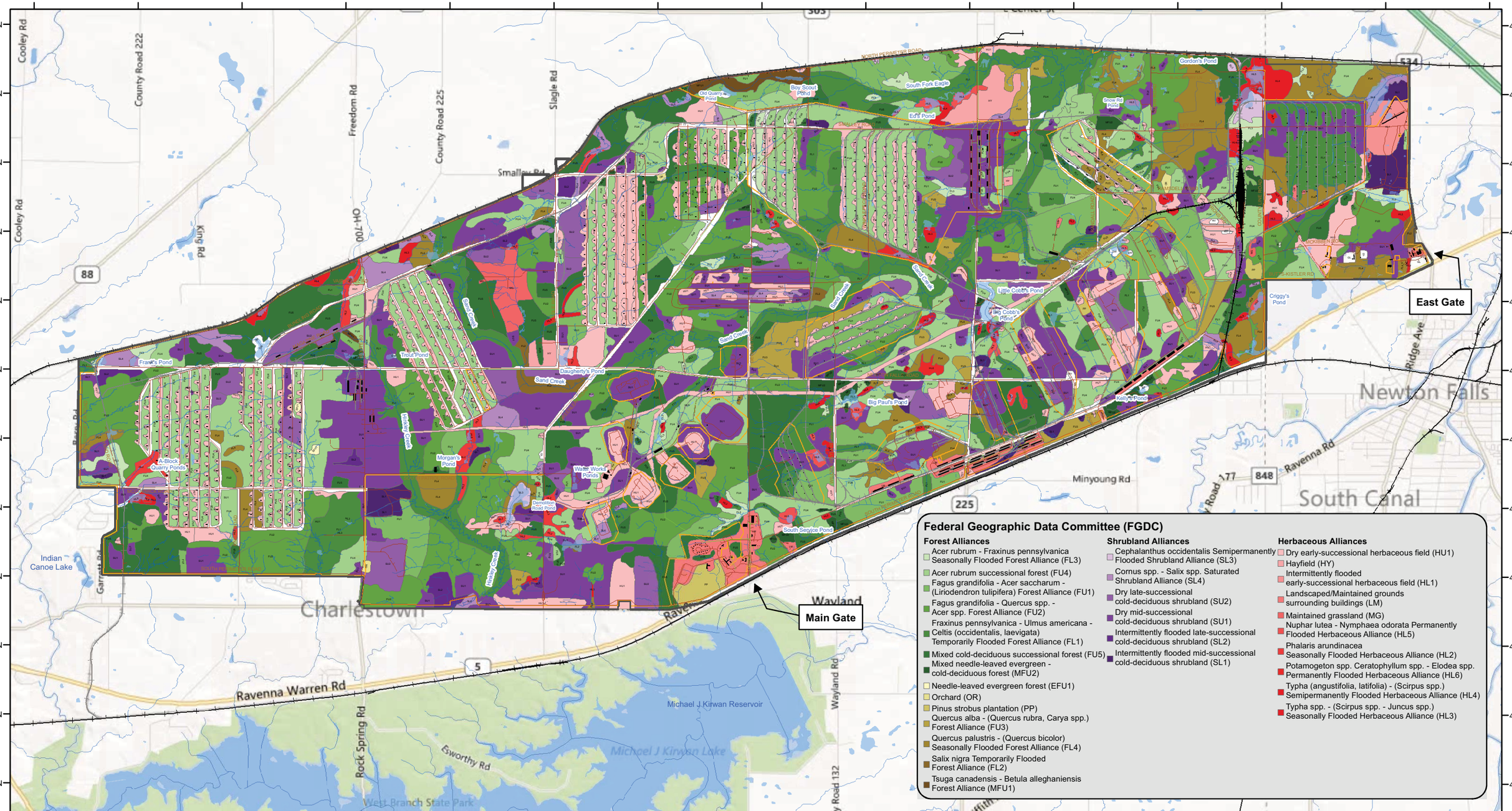
Above Ground Electrical Line
Fence
Road/Trail
Creek/Stream
Active Railroad
Inactive Railroad
Waterbody
Building
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013

Ohio Army National Guard

ARNG Training Center
Garrison Command



Federal Geographic Data Committee (FGDC)

Forest Alliances

- Acer rubrum - Fraxinus pennsylvanica Seasonally Flooded Forest Alliance (FL3)
- Acer rubrum successional forest (FU4)
- Fagus grandifolia - Acer saccharum - (Liriodendron tulipifera) Forest Alliance (FU1)
- Fagus grandifolia - Quercus spp. - Acer spp. Forest Alliance (FU2)
- Fraxinus pennsylvanica - Ulmus americana - Celtis (occidentalis, laevigata) Temporarily Flooded Forest Alliance (FL1)
- Mixed cold-deciduous successional forest (FU5)
- Mixed needle-leaved evergreen - cold-deciduous forest (MFU2)
- Needle-leaved evergreen forest (EFU1)
- Orchard (OR)
- Pinus strobus plantation (PP)
- Quercus alba - (Quercus rubra, Carya spp.) Forest Alliance (FU3)
- Quercus palustris - (Quercus bicolor) Seasonally Flooded Forest Alliance (FL4)
- Salix nigra Temporarily Flooded Forest Alliance (FL2)
- Tsuga canadensis - Betula alleghaniensis Forest Alliance (MFU1)

Shrubland Alliances

- Cephalanthus occidentalis Semipermanently Flooded Shrubland Alliance (SL3)
- Cornus spp. - Salix spp. Saturated Shrubland Alliance (SL4)
- Dry late-successional cold-deciduous shrubland (SU2)
- Dry mid-successional cold-deciduous shrubland (SU1)
- Intermittently flooded late-successional cold-deciduous shrubland (SL2)
- Intermittently flooded mid-successional cold-deciduous shrubland (SL1)

Herbaceous Alliances

- Dry early-successional herbaceous field (HU1)
- Hayfield (HY)
- Intermittently flooded early-successional herbaceous field (HL1)
- Landscaped/Maintained grounds surrounding buildings (LM)
- Maintained grassland (MG)
- Nuphar lutea - Nymphaea odorata Permanently Flooded Herbaceous Alliance (HL5)
- Phalaris arundinacea Seasonally Flooded Herbaceous Alliance (HL2)
- Potamogeton spp. Ceratophyllum spp. - Elodea spp. Permanently Flooded Herbaceous Alliance (HL6)
- Typha (angustifolia, latifolia) - (Scirpus spp.) Semipermanently Flooded Herbaceous Alliance (HL4)
- Typha spp. - (Scirpus spp. - Juncus spp.) Seasonally Flooded Herbaceous Alliance (HL3)

1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 9. SAIC Community Alliance Map (FGDC)
Camp Ravenna Joint Military Training Center

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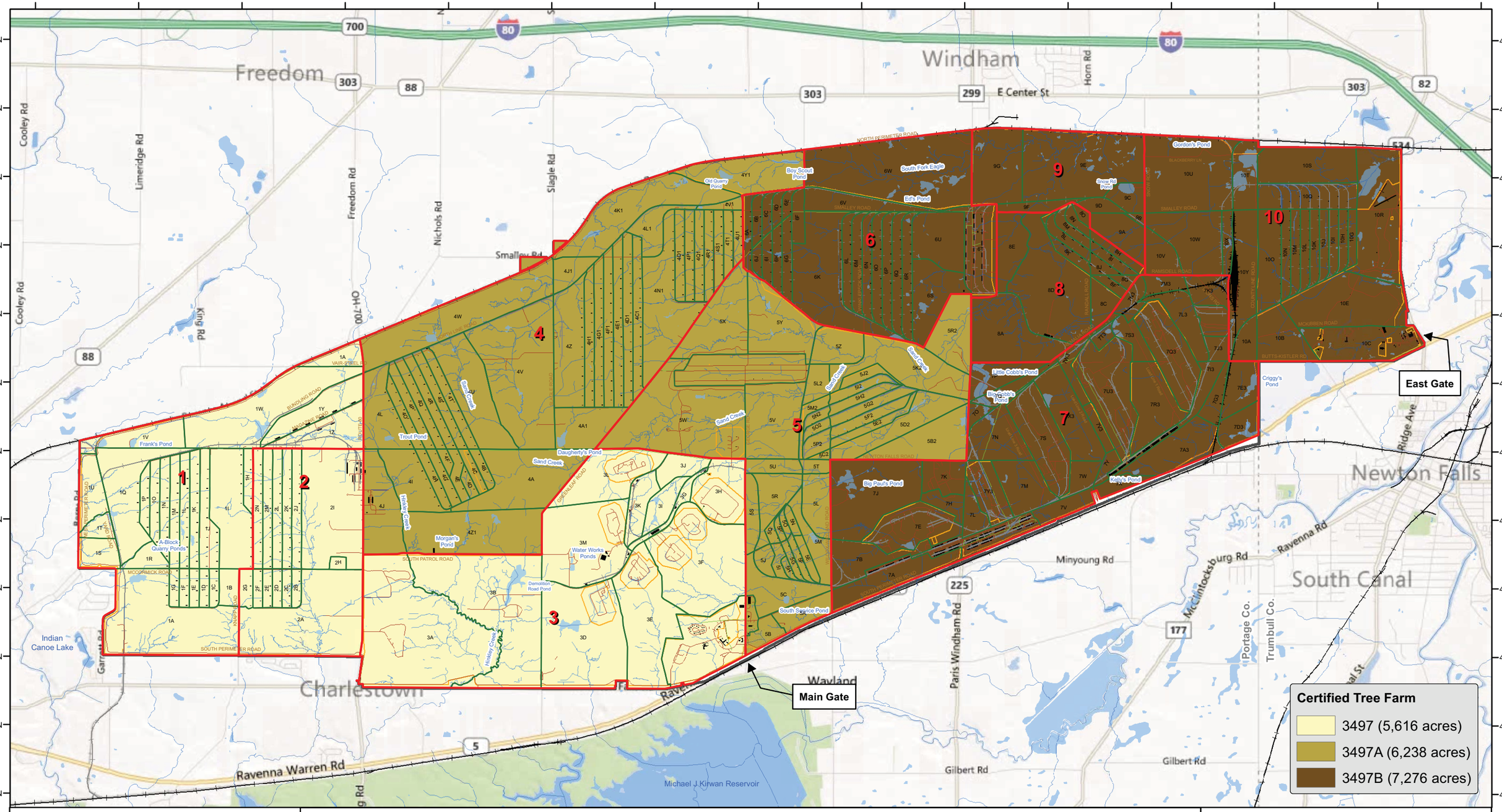
Ohio Army National Guard

Above Ground Electrical Line
Fence
Road/Trail
Creek/Stream
Active Railroad
Inactive Railroad
Waterbody
Building
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013

ARNG Training Center
Garrison Command



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 10a. Forest Management Map
Camp Ravenna Joint Military Training Center

No warranty is made by the OHARNG/ARNG as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. This map is a "living document", in that it is intended to change as new data become available and is incorporated into the Enterprise GIS database.

Above Ground Electrical Line
Fence
Road/Trail
Active Railroad
Inactive Railroad
Creek/Stream
Waterbody
Building
Timber Compartment
Timber Cutting Unit
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/26/2013

Ohio Army National Guard

ARNG Training Center
Garrison Command

Certified Tree Farm 3497A
6,238 acres

Certified Tree Farm 3497B
7,276 acres

Certified Tree Farm 3497
5,616acres

East Gate

Main Gate

1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

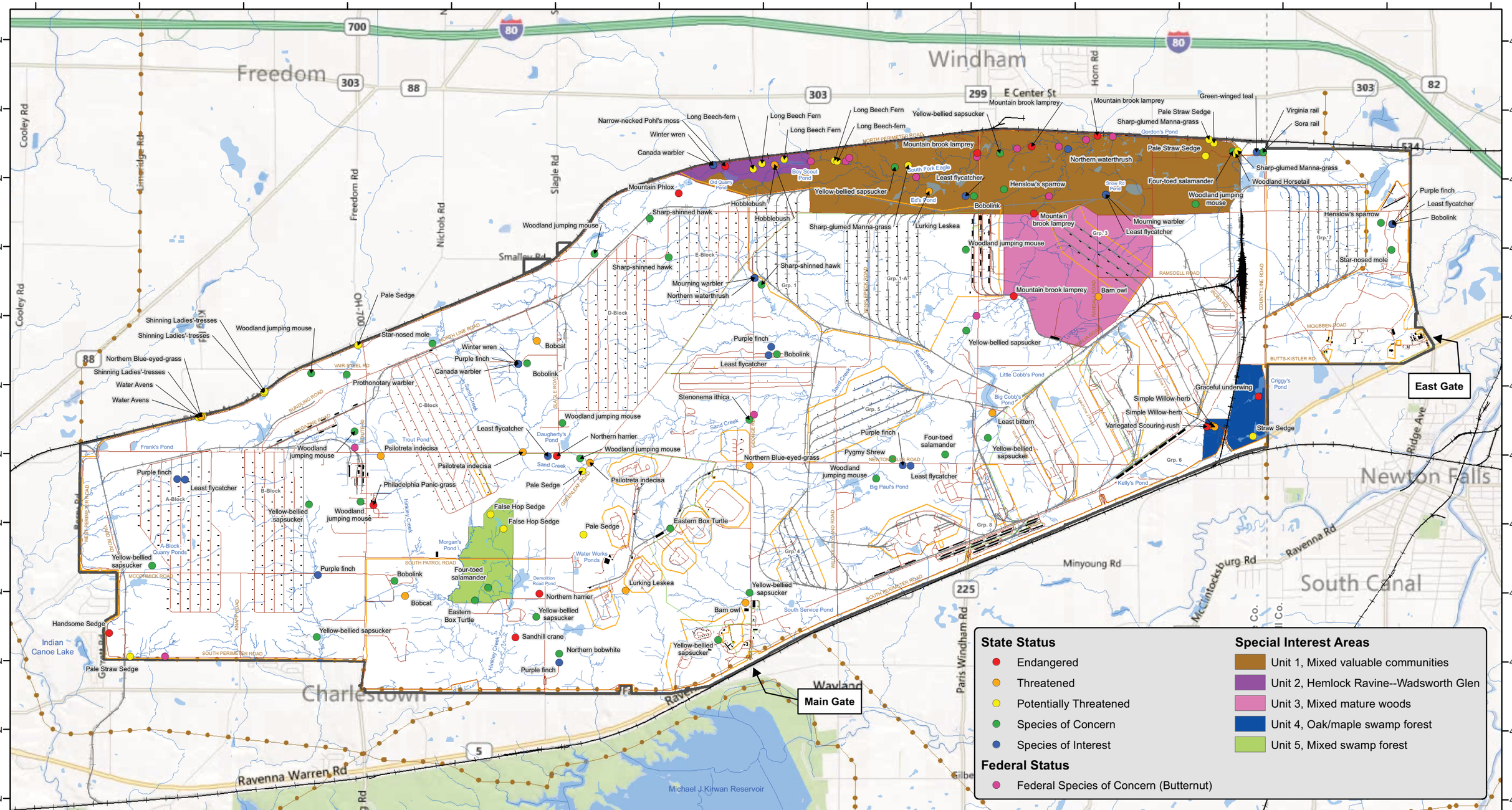
Figure 10b. Forest Management Map
Camp Ravenna Joint Military Training Center

Certified Tree Farm Boundary
Creek/Stream
Timber Compartment
Timber Cutting Unit
Waterbody
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/26/2013

Ohio Army National Guard

ARNG Training Center
Garrison Command



State Status

- Endangered
- Threatened
- Potentially Threatened
- Species of Concern
- Species of Interest

Federal Status

- Federal Species of Concern (Butternut)

Special Interest Areas

- Unit 1, Mixed valuable communities
- Unit 2, Hemlock Ravine--Wadsworth Glen
- Unit 3, Mixed mature woods
- Unit 4, Oak/maple swamp forest
- Unit 5, Mixed swamp forest

1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

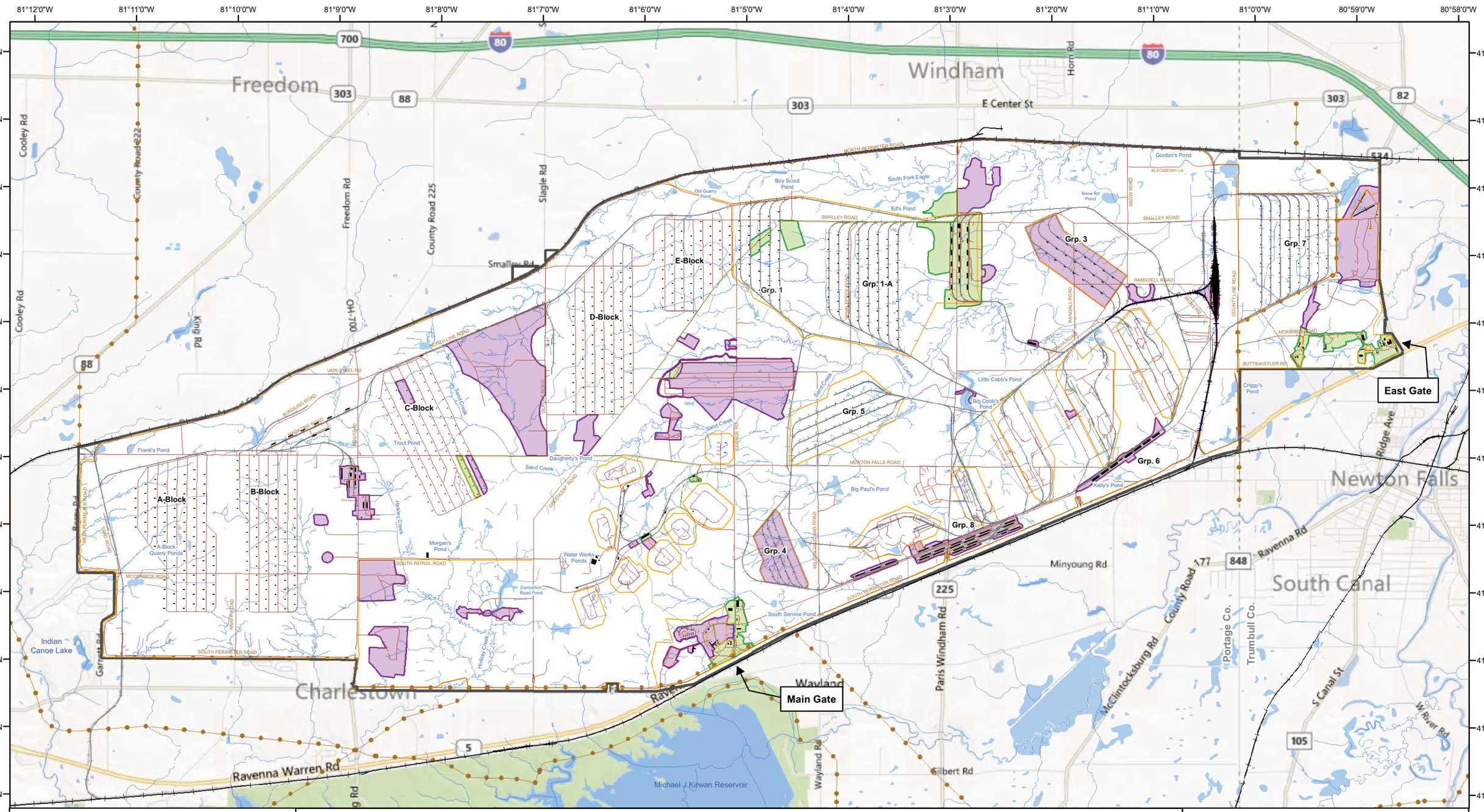
Figure 11. Rare Species Locations
Camp Ravenna Joint Military Training Center

Above Ground Electrical Line
Fence
Active Railroad
Inactive Railroad
Road/Trail
Creek/Stream
Waterbody
Building
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/19/2013

Ohio Army National Guard

ARNG Training Center Garrison Command



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Ohio Army National Guard

Figure 12. Improved, Semi-Improved, and Unimproved Grounds
Camp Ravenna Joint Military Training Center

- Above Ground Electrical Line
- Road/Trail
- Fence
- Active Railroad
- Inactive Railroad
- Pipeline
- Creek/Stream
- Waterbody
- Building
- Improved Grounds
- Semi-Improved Grounds
- Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013

ARNG Training Center
Garrison Command

Areas with Unrestricted Mowing Times

- Camp Ravenna Cantonment Areas - Less Field West of Fuel Point
- All Roadsides and Roadside Ditches
- All Training Area Access/Maneuver Trails
- Around all Parking Areas, Motor Pools, Fuel Points, Wash Racks
- Perimeter Fence - One pass on either side of fence
- Internal Fences Trumbull County Side and TTB Portage County Side
- Slagle Road Drop Z one - Mowed by AFRES
- YAK Drop Zone - NW and SE Portions
- MPMG Range ROCA and Line of Sight to Targets
- All Active Ranges Except the MPMG Impact Area and MMPTR
- Shoot House
- Buildings 812, 813, LL#5 Parking (across from 813), and NBC Training Chamber
- Depot Administration Area
- Tactical Training Base (TTB), Rappel Tower, Leadership Reaction Course
- Active Training Areas – Designated Areas (see map)
- Groups 3, 4, 6, 7 and 8 - Access Lanes and Around Buildings
- C-Block ASP, CE Storage and Active Igloos
- Helipads
- Cobb's Pond Picnic Area
- All Pond Earthen Dams and Access Roads

Notes: See the Camp Ravenna Vegetation Control Plan for more details.

Areas with Restricted Mowing Times

- Perimeter Fence - Expanse Area
- Power Lines Outside of Unrestricted Areas – Active and Inactive Lines
- All Tornado Shelter and Inactive Igloos – Except Igloos with Target Lifters
- TVMA – Except Target Lifters
- MMPTR – Except Range Tower/Buildings, BP's, Target Lifters
- Bore Sight Lane North of Helipads on East Side
- MPMG Range Impact Area
- YAK Drop Zone - Portions Where Delayed Mowing Does Not Impact Mission
- Field East of the Rappel Tower
- Ramsdell Landfill
- Old Administration Area Fence Line
- Open Demolition Areas #1 and #2
- Hunting Access Lanes
- Primary Grassland Areas (see Figure 14. Grassland Management)

Mowing Plan

Restricted Mowing
Mowing permitted before 15 April or after 15 August

Unrestricted Mowing
Mowing permitted 365 days per year

1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

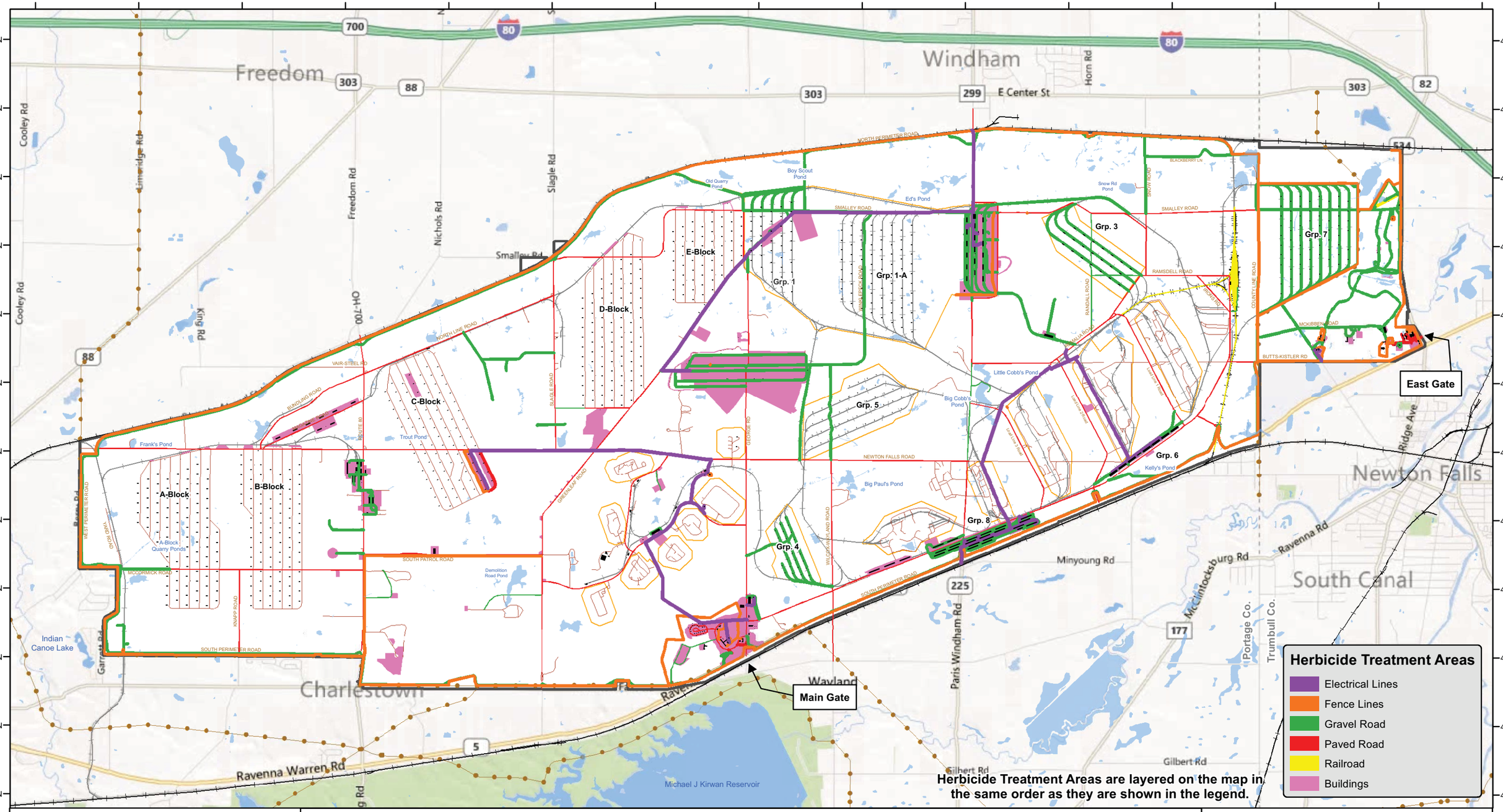
Figure 13. Mowing Plan
Camp Ravenna Joint Military Training Center

Above Ground Electrical Line
Fence
Road/Trail
Pipeline
Active Railroad
Inactive Railroad
Creek/Stream
Waterbody
Building
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/21/2013

Ohio Army National Guard

ARNG Training Center
Garrison Command



Herbicide Treatment Areas

- Electrical Lines
- Fence Lines
- Gravel Road
- Paved Road
- Railroad
- Buildings

Herbicide Treatment Areas are layered on the map in the same order as they are shown in the legend.

1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 14. Herbicide Vegetation Control Map
Camp Ravenna Joint Military Training Center

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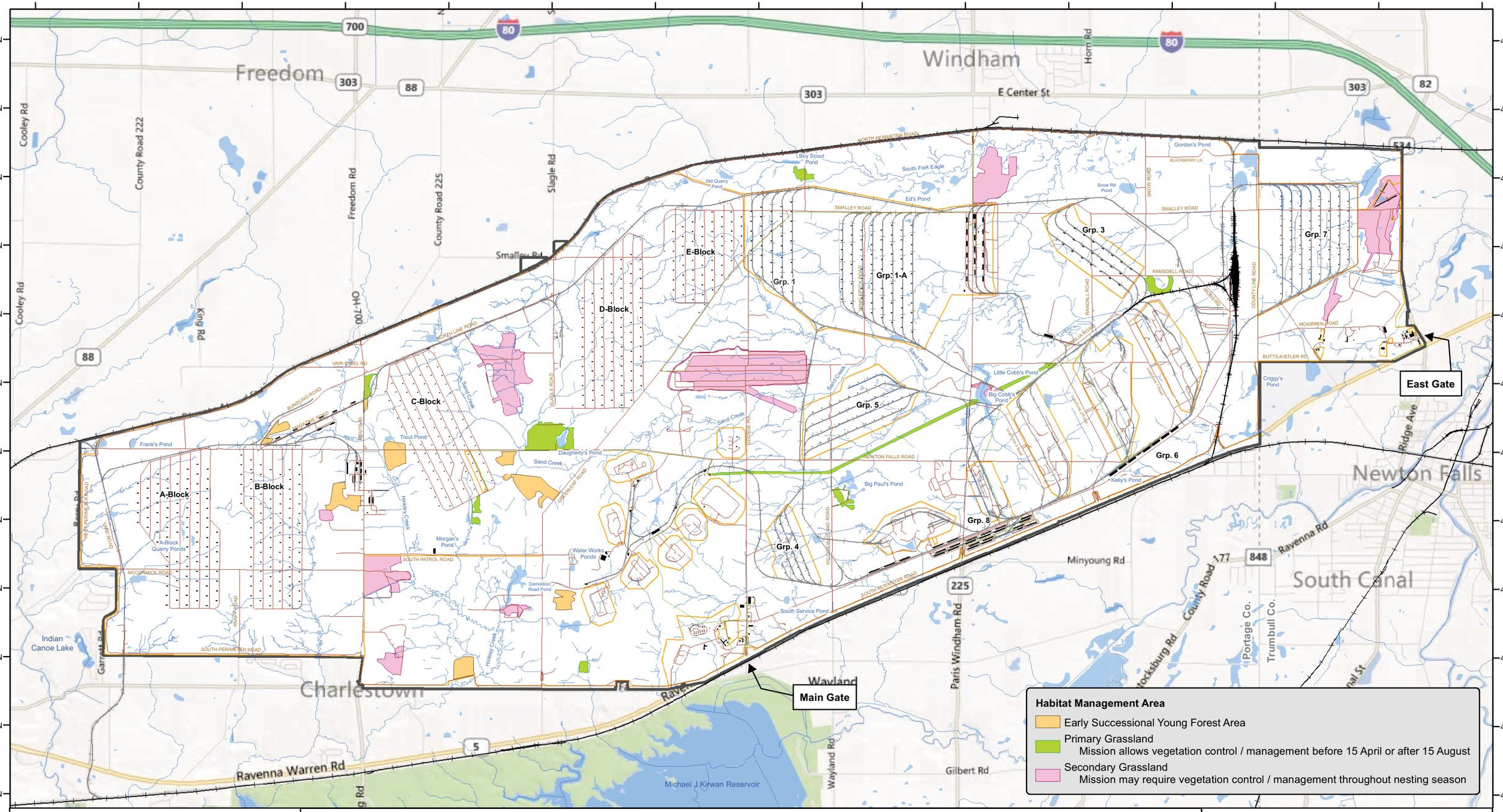
Fence
Road/Trail
Pipeline
Active Railroad
Inactive Railroad
Waterbody
Building
Camp Ravenna Boundary

Ohio Army National Guard

ARNG Training Center
Garrison Command

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/23/2013



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

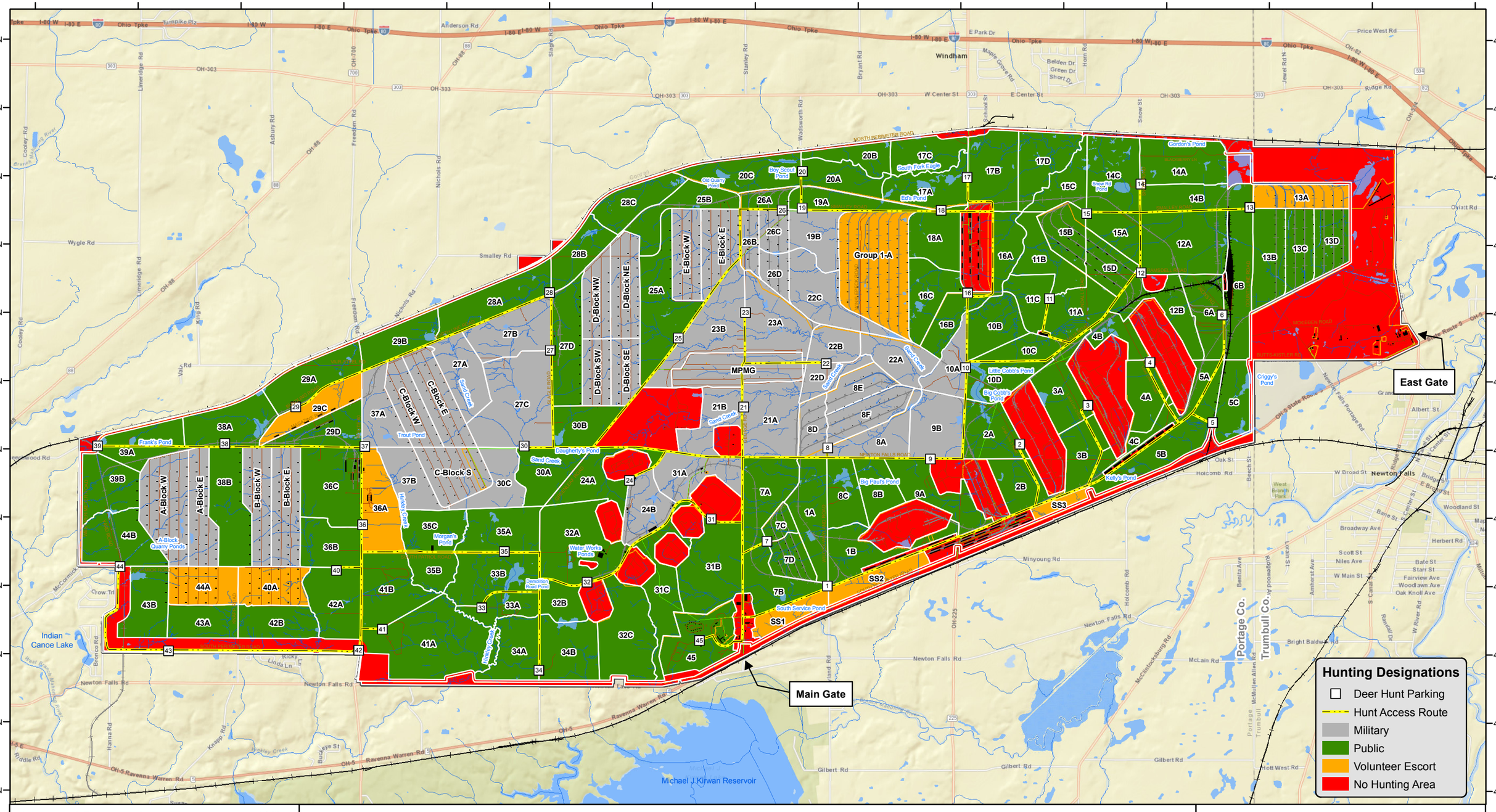
Figure 15. Habitat Management Areas
Camp Ravenna Joint Military Training Center

Above Ground Electrical Line
Fence
Road/Trail
Creek/Stream
Active Railroad
Inactive Railroad
Waterbody
Building
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013

Ohio Army National Guard

ARNG Training Center
Garrison Command



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

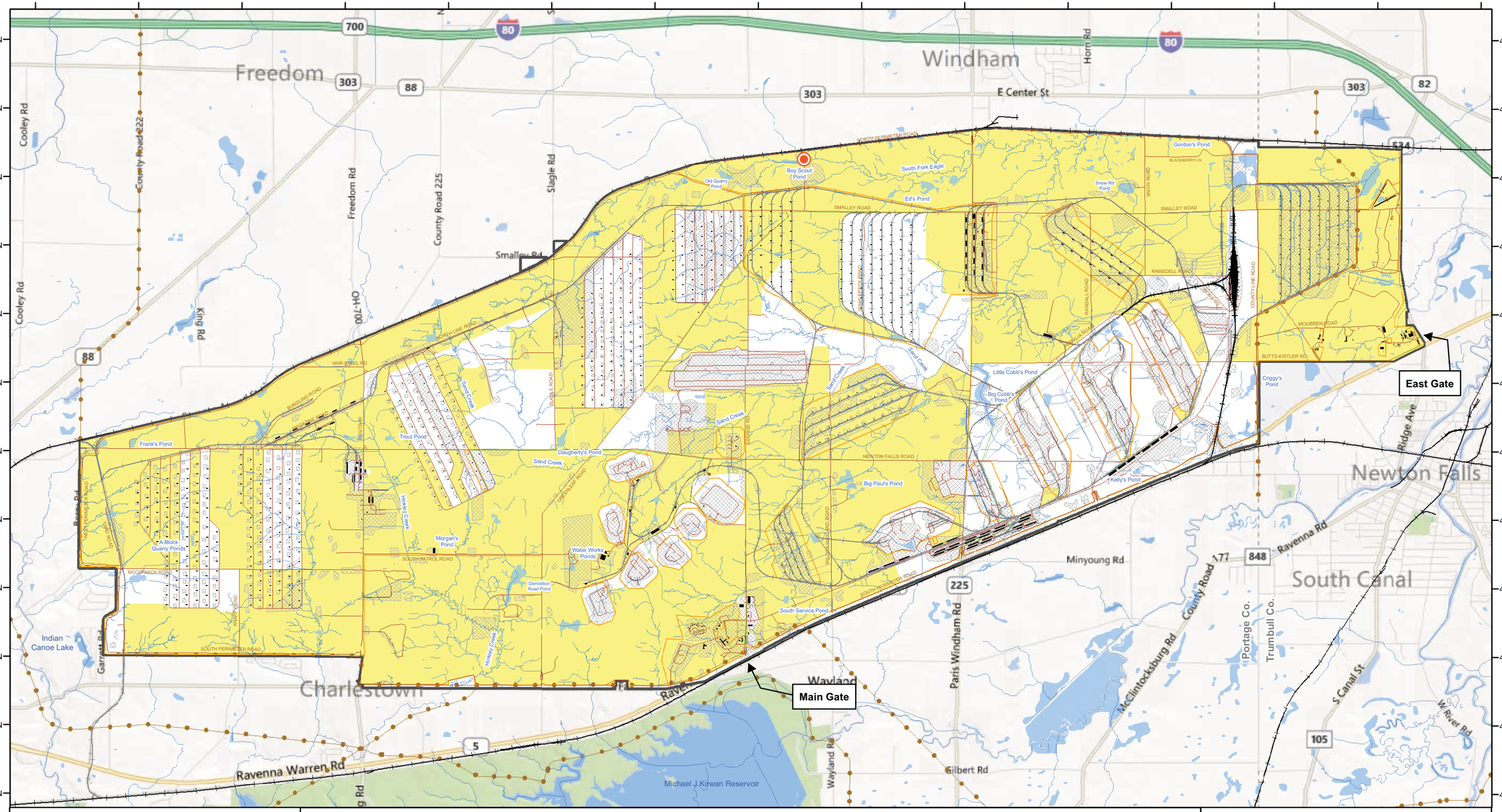
Figure 16. Hunting Areas Map
Camp Ravenna Joint Military Training Center

Above Ground Electrical Line
Fence
Road/Trail
Creek/Stream
Active Railroad
Inactive Railroad
Waterbody
Building
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 7/30/2014

Ohio Army National Guard

ARNG Training Center Garrison Command



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 17. Cultural Resource / Archaeological Survey Map
Camp Ravenna Joint Military Training Center

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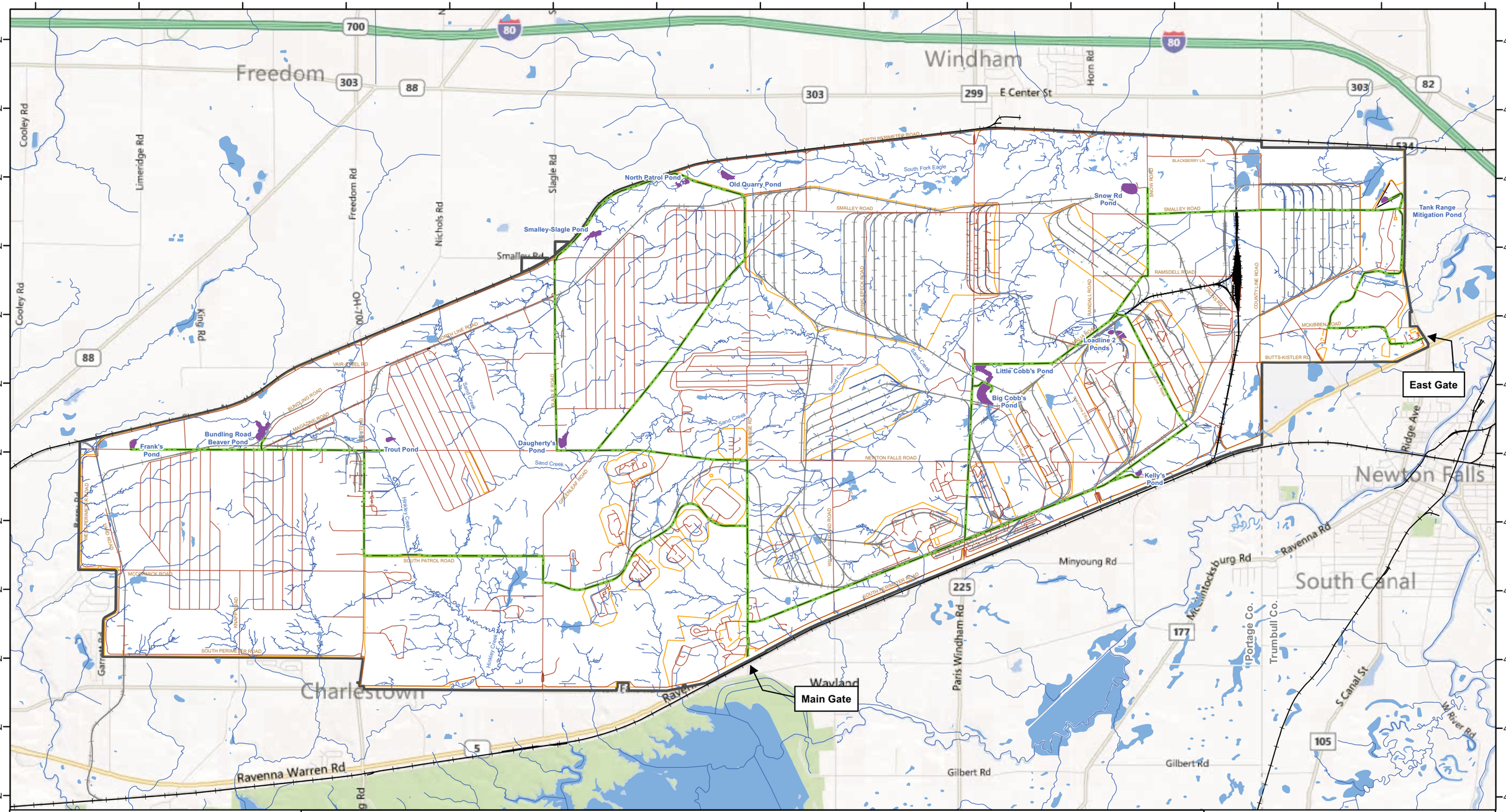
- Above Ground Electrical Line
- Stone Arch Bridge
- Disturbed Ground
- Pipeline
- Road/Trail
- Fence
- Active Railroad
- Inactive Railroad
- Creek/Stream
- Survey Area
- Waterbody
- Building
- Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013

Ohio Army National Guard

ARNG Training Center
Garrison Command



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 18. Fishing Areas
Camp Ravenna Joint Military Training Center

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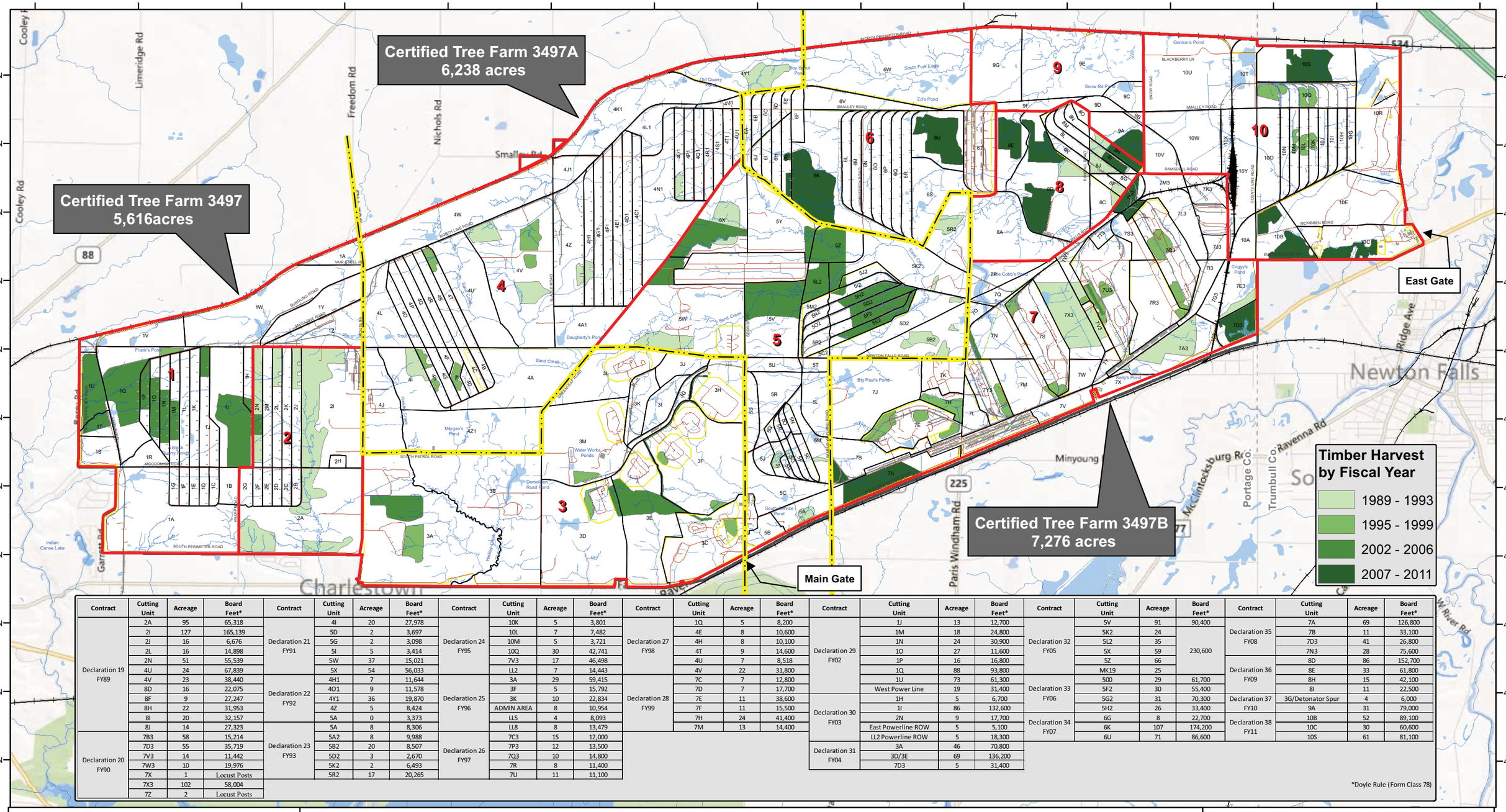
Ohio Army National Guard

ARNG Training Center
Garrison Command

Access Route
Fence
Active Railroad
Inactive Railroad
Road/Trail
Creek/Stream
Fishing Ponds
Waterbody
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/23/2013



Contract	Cutting Unit	Acreage	Board Feet*
Declaration 19 FY89	2A	95	65,318
	2I	127	165,139
	2J	16	6,676
	2L	16	14,898
	2N	51	55,539
	4U	24	67,839
	4V	23	38,440
	8D	16	22,075
	8F	9	27,247
	8H	22	31,953
	8I	20	32,157
	8J	14	27,323
Declaration 20 FY90	7B3	58	15,214
	7D3	55	35,719
	7V3	14	11,442
	7W3	10	19,976
	7X	1	Locust Posts
	7X3	102	58,004
	7Z	2	Locust Posts

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 21 FY91	4I	20	27,978
	5D	2	3,697
	5G	2	3,098
	5I	5	3,414
	5W	37	15,021
	5X	54	56,033
Declaration 22 FY92	4H1	7	11,644
	4O1	9	11,578
	4Y1	36	19,870
	4Z	5	8,424
	5A	0	3,373
Declaration 23 FY93	5A	8	8,306
	5A2	8	9,988
	5B2	20	8,507
	5D2	3	2,670
	5K2	2	6,493
	5R2	17	20,265

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 24 FY95	10K	5	3,801
	10L	7	7,482
	10M	5	3,721
	10Q	30	42,741
	7V3	17	46,498
	LL2	7	14,443
Declaration 25 FY96	3A	29	59,415
	3F	5	15,792
	3K	10	22,834
	ADMIN AREA	8	10,954
	LL5	4	8,093
Declaration 26 FY97	LL8	8	13,479
	7C3	15	12,000
	7P3	12	13,500
	7Q3	10	14,800
	7R	8	11,400
	7U	11	11,100

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 27 FY98	1Q	5	8,200
	4E	8	10,600
	4H	8	10,100
	4T	9	14,600
	4U	7	8,518
	4V	22	31,800
Declaration 28 FY99	7C	7	12,800
	7D	7	17,700
	7E	11	38,600
	7F	11	15,500
	7H	24	41,400
	7M	13	14,400

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 29 FY02	1J	13	12,700
	1M	18	24,800
	1N	24	30,900
	1O	27	11,600
	1P	16	16,800
	1Q	88	93,800
	1U	73	61,300
	West Power Line	19	31,400
Declaration 30 FY03	1H	5	6,700
	1I	86	132,600
	2N	9	17,700
	East Powerline ROW	5	5,100
	LL2 Powerline ROW	5	18,300
Declaration 31 FY04	3A	46	70,800
	3D/3E	69	136,200
	7D3	5	31,400

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 32 FY05	5V	91	90,400
	5K2	24	230,600
	5L2	35	
	5X	59	
	5Z	66	
	MK19	25	
Declaration 33 FY06	500	29	61,700
	5F2	30	55,400
	5G2	31	70,300
	5H2	26	33,400
Declaration 34 FY07	6G	8	22,700
	6K	107	174,200
	6U	71	86,600

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 35 FY08	7A	69	126,800
	7B	11	33,100
	7D3	41	26,800
	7N3	28	75,600
	8D	86	152,700
Declaration 36 FY09	8E	33	61,800
	8H	15	42,100
	8I	11	22,500
Declaration 37 FY10	3G/Detonator Spur	4	6,000
	9A	31	79,000
Declaration 38 FY11	10B	52	89,100
	10C	30	60,600
	10S	61	81,100

*Doyle Rule (Form Class 78)

1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Ohio Army National Guard

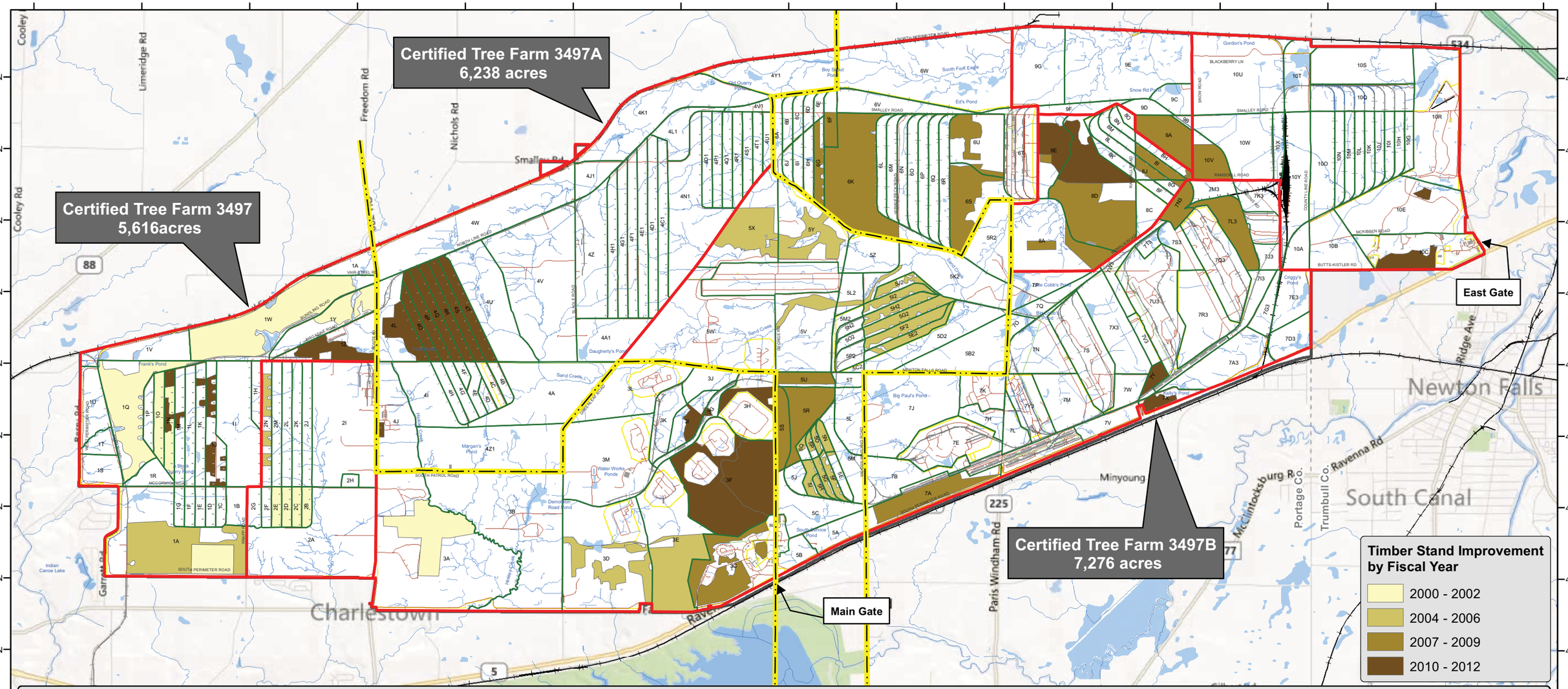
Figure 19. Timber Harvest History
Camp Ravenna Joint Military Training Center

- Above Ground Electrical Line
- Road/Trail
- Fence
- Active Railroad
- Inactive Railroad
- Certified Tree Farm Boundary
- Creek/Stream
- Waterbody
- Building
- Timber Compartment
- Timber Cutting Unit
- Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N

Date: 8/26/2013

ARNG Training Center
Garrison Command



Fiscal Year	Cutting Unit	Acreage
2000	1Q	150
	1W	229
	1Y	47
	3A	122

Fiscal Year	Cutting Unit	Acreage
2002	1A	51
	1N	45
	1O	38
	2B	17
	2C	17
	2D	17
	2E	17

Fiscal Year	Cutting Unit	Acreage
2004	1A	170
	2N	26
2005	3D/3E	208
	MK19	36
	MK19N	155
2006	Group 4	74
	Group 5	166

Fiscal Year	Cutting Unit	Acreage
2007	5R	82
	5S	46
	5U	29
	6G	30
	6K	266
	6S	94
	6U	42

Fiscal Year	Cutting Unit	Acreage
2007 (cont'd)	7A	76
	7L3	77
	7N3	34

Fiscal Year	Cutting Unit	Acreage
2008	8A	11
	8A	35
	8D	167
	8E	4
	8I	26
	8J	13

Fiscal Year	Cutting Unit	Acreage
2009	10V	50
	3C	108
	9A	81
	9A	1

Fiscal Year	Cutting Unit	Acreage
2010	10E	5
	3F	154
	3F	129
	8D/8E	138

Fiscal Year	Cutting Unit	Acreage
2011	10C	40
	1Z	49
	3H	26
	3I	20
	4J	5
	A Block	57

Fiscal Year	Cutting Unit	Acreage
2012	4L	49
	4O-T	261
	7X	14
	7Y	17

1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 20. Timber Stand Improvement History
Camp Ravenna Joint Military Training Center

Above Ground Electrical Line
Road/Trail
Fence
Active Railroad
Inactive Railroad
Certified Tree Farm Boundary
Creek/Stream
Waterbody
Building
Timber Compartment
Timber Cutting Unit
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N

Date: 8/26/2013

Ohio Army National Guard

ARNG Training Center
Garrison Command

Appendix A
Interagency Coordination

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CONTENTS

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STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

6 March 2014

Environmental Office

Camp Ravenna Joint Military Training Center
Integrated Natural Resources Management Plan (INRMP)
Cooperating Agency

Reference: Draft Updated Integrated Natural Resources Management Plan (INRMP), Camp Ravenna Joint Military Training Center (CRJMTC), Ohio

Dear Cooperating Agency,

The US Fish and Wildlife Service (USFWS), Ohio Department of Natural Resources (ODNR), ODNR Division of Wildlife (DOW), and the Ohio Army National Guard (OHARNG) met at Camp Ravenna on 19 December 2012 and conducted a formal INRMP review for operation and effect (ROE). The conclusion of the ROE was that the Camp Ravenna INRMP is working. It provides for adaptive management of natural resources and helps support sustainable use of the property for military training. It was decided to update and continue implementation of the current INRMP and that a major revision is not needed. The enclosed draft INRMP is the second update to the original 2001 INRMP (first update dated 2008). The text, implementation and project schedules, figures and GIS data have been updated as described in the bullet list below. There have been no substantive changes to the natural resources management programs or methodologies with this update. Support of the military mission is still the main focus of the program and natural resources management that enables sustainable military land use continues to be a primary goal.

Since the ROE and during the finalization of the draft updated INRMP, the northern long-eared bat (*Myotis septentrionalis*) was proposed for listing as a federally endangered species. We realize listing of the northern long-eared bat (NLEB) will require additional evaluation of natural resources management and other activities at Camp Ravenna and implementation of measures to ensure its protection and proactive management of its habitat. We have recently been in contact with Angela Boyer of the USFWS, Columbus Field Office and intend to proceed with programmatic consultation and incorporation of the results into the INRMP. It is our intention is to provide general information on the NLEB in the INRMP and to incorporate more specific guidance (our programmatic consultation and/or USFWS recovery plans/management guidelines) by reference and possibly by inclusion in an appendix. Doing this will enable adaptive management as mission activities and/or USFWS guidance changes without having to update the INRMP text.

We have provided each of our cooperating agencies with a complete copy of the draft INRMP but do not expect a thorough review and comment on the entire document. Many sections are unchanged or were only edited to update facility descriptions or other general information. Our intention is to have you review just the portions of the plan that were updated to ensure that your agency concurs there have been no substantive changes to our management programs or methodologies. The below list identifies the updates that were made to the 2008 Camp Ravenna INRMP to help focus your review efforts.

- General clerical changes have been made throughout the INRMP to capture the change in name from the Ravenna Training and Logistics Site (RTLS) to Camp Ravenna Joint Military Training Center (CRJMTC). The text has also been revised to reflect the transfer of last 1,200 acres of the former Ravenna Army Ammunition Plant and management of the Installation Restoration Program to from the Base Realignment and Closure Office (BRACO) to the Army National Guard Bureau (ARNG)/OHARNG.

- A description of the 9 April 2012 ARNG INRMP Guidance was added to Section 1.1 and Regulations, directives, instructions, etc. cited in Section 1.2 and throughout the INRMP have been updated.

- Section 1.5.3 was edited to expand the principles and guidelines of ecosystem management and to incorporate the guidance on biodiversity conservation identified in DODI 4715.03.

- The text in Section 2.4 and subsections, Section 2.5, and as appropriate elsewhere has been updated to reflect ongoing facilities upgrades and associated increases in military mission capability and the land use classification (improved, semi-improved, unimproved) acreages in Table 16 have been updated accordingly.

- Section 2.6 was updated to identify current facility usage.

- GIS data and mapping have been updated. Associated text changes necessitated by the updated GIS data, such as wetland acreages, miles of streams, pond acreage (Table 5), etc., have been made throughout the INRMP.

- Section 3.4.1.4 and Table 6 have been updated with the most current wetland information and Section 3.4.1.5 and Table 7 were added to identify onsite wetland mitigation areas that must be managed and protected in perpetuity. A statement was added to Section 6.6 regarding protection and management of onsite wetland mitigation areas.

- Changes to grassland management areas have been made (Sections 4.2.5.1 and 4.2.5.2) to facilitate mission support needs and successional young forest habitat management areas have been identified (Section 4.2.5.3). Section 6.9 on grassland, old field and successional forest management has been updated as well.

- Natural resources data and species lists have been updated based on data from flora and fauna surveys conducted since the last update. References to current surveys where

included throughout the INRMP where applicable. This updated information is found throughout Section 4: Ecosystems and the Biotic Environment.

- Section 4.4, subsections and Tables 13 and 14 have been updated to reflect current status and list of rare species and to correct acreages of the Special Management Areas. NLEB information is found in Sections 4.3.1, 4.4., 6.4, 6.4.1, 6.4.1.8, 6.8, 6.8.1, and 6.8.9.3. Further edits may be needed for some or all of these sections to facilitate NLEB management.

- Table 15 was updated to reflect most current soil stabilization time limits for bare earth and to add an over-seedling on annual ryegrass to native seed mixes for the purpose of establishing a quick vegetative cover of a non-persistent grass while native species are more slowly germinating, establishing roots and greening up.

- Forest Management Section 6.8 and/or applicable subsections have been updated to identify the need to manage for the NLEB, to include the latest information on forest insect and disease management, to update forest inventory data and to update the timber harvest and Timber Stand Improvement (TSI) schedules (Appendix H).

- Section 6.12.4 was updated to reflect the current state and federally listed noxious weeds on the Camp Ravenna property and those noxious/invasive species that are actively managed/controlled due to their potential to negatively impact training land and mission.

- None of the goals and objectives in Section 7 have been modified for the current INRMP implementation period. Three projects have been slightly modified and two projects have been added. Project 3.1.2 to conduct Indian bat surveys was updated to make it more inclusive of all bat species. Projects 3.1.3 and 3.1.4 were modified to put the base-wide bird survey a 10 year interval instead of a five year interval. The annual breading bird survey has not been modified. Habitat management projects 5.3.4 and 5.3.5 were added to capture management practices being implemented to enhance the trainingscape and the young forest management initiative (Sections 4.2.5.3 and 6.9).

- The second paragraph in Section 8 has been edited to explain how Table 18, Implementation Projects is managed. Table 18 has been updated to show planned projects and projected funding needs out to FY18.

- All figures have been updated and Figure 4a, Topographic Map; Figure 10b, Forest Management Map (Aerial Photo); Figure 18, Fishing Areas; Figure 19, Timber Harvest History; and Figure 20, TSI History are new maps.

- Agency correspondence associated with the current ROE/INRMP update along with the ROE meeting minutes and information have been added to Appendix A. Agency concurrence letters for the INRMP update will also be added when received.

- The INRMP Implementation Analysis (Appendix B), used to document degree of INRMP implementation, has been updated.

- Natural Resource flora & fauna species lists have been updated to include new data collected since the INRMP was last updated in 2008 and to reflect the current status of rare species on site (Table 13, Table 14 and Appendix D).

- The Camp Ravenna Hunting Regulation (Appendix E) was renumbered as Camp Ravenna Regulation 200-3 and updated to reflect current practice.

- The Vegetation Control Plan (Appendix F and Sections 6.7 and 6.12.3) has been updated to reflect current practice associated with facilities upgrades and to identify the Ohio EPA NPDES permit requirements for herbicide applications in wetlands.

- The Deer Hunt Volunteer Escort Program Information (Appendix I) was updated to reflect current practice.

As part of the INRMP update, planning level surveys (PLSs) for fauna, flora, soils, surface water, threatened and endangered species, vegetative communities, and wetlands were updated. When the finals are available copies of these PLS's will be sent to our cooperating agencies and ARNG.

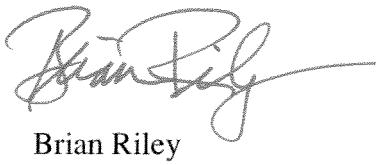
Because the INRMP update does not change the INRMP goals and objects and the INRMP is designed to be adaptive and allow the flexibility needed to support various military mission activities and to effectively address emerging natural resources management issues such as the newly listed NLEB, continued implementation of the INRMP is not expected to result in biophysical consequences materially different than those anticipated when the INRMP was initially implemented. In accordance with ARNG and Department of Army guidance, continued implementation of the updated INRMP is considered to be adequately addressed by the existing INRMP Environmental Assessment (EA). A draft Environmental Checklist and Record of Environmental consideration (REC) citing the 2001 INRMP EA has been developed and included as Appendix C of the updated INRMP. Please note that Section 7 Endangered Species Act (ESA) consultation was not conducted at this time because updating the plan is entirely of an administrative nature and in and of itself will have no affect on any federally listed species or designated critical habitat. The INRMP and the existing EA require ESA compliance as part of the implementation process and Section 7 consultation is conducted on specific projects or on a programmatic basis as part of the INRMP implementation process verses the INRMP update process.

This draft updated INRMP has been sent to the Army National Guard (ARNG-ILE-CR), the US Fish and Wildlife Service, the Ohio Department of Natural Resources, and the Ohio Division of Wildlife District 3 office for review and comment. Our hope is that we'll be able to address comments by teleconference and will be able to make final edits without having to produce a full draft final updated INRMP for distribution and a second review. If so, we will make page revisions and will distribute them for you to insert into your draft updated INRMP to make it final. If requested or necessary, we will produce another document, draft final updated INRMP, and will distribute it for a second review period.

In order to facilitate comment consolidation, review and response we will email each cooperating agency a blank errata spreadsheet (Excel spreadsheet) to record your comments. We understand if an agency policy requires a written response on agency lettered and have no problem accepting comments in that form. We will put together a combined errata spreadsheet of comments and responses and provide it for our comment resolution teleconference. This combined errata spreadsheet and any written comments we receive will be placed in Appendix A of the INRMP along with the ROE documentation to document the review and updating process. The final updated INRMP will be produced when all comments are satisfactorily resolved. At that time we will request a letter of concurrence from each agency.

Your agency points of contact will receive a blank errata by email sheet within the next few days. Please return the completed errata spreadsheet and/or your written comments by email to brian.p.riley17.ctr@mail.mil or by mail to Brian Riley, Camp Ravenna ENV, 1438 State Route 534 SW, Newton Falls, OH 44444 no later than 7 May 2014. The point of contact for this action is the undersigned at (614) 336-4564.

Sincerely,



Brian Riley
Natural Resources Manager

Encl

Distribution:

Dr. Mary Knapp
US Fish and Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Road, Ste. 104
Columbus, Ohio 43230
614-416-8993 x12
Mary_m_knapp@fws.gov

John Kessler, P.E.
Ohio Department of Natural Resources
2045 Morse Road
Columbus, OH 43229-6605
614-265-6621
John.Kessler@dnr.state.oh.us

Mr. Scott Peters
Wildlife Management Supervisor
Ohio Division of Wildlife
912 Portage Lakes Drive
Akron, OH 44319
330-644-2293
Scott.Peters@dnr.state.oh.us

Army National Guard
Attn: ARNG-ILE-CR (Mr. Steve Stadelman)
111 S. George Mason Drive
Arlington, VA 22204
703-607-9954
Steven.p.stadelman.civ@mail.mil

LTC William E. Meade
Camp Ravenna JMTC
1438 State Route 534 SW
Newton Falls, OH 44444
614-336-6560
William.e.meade.mil@mail.mil

CC w/o encl: Paul Richert
Federal Projects Coordinator
U.S. Fish and Wildlife Service
5600 American Blvd. West, Suite 990
Bloomington, MN 55437-1458
Paul_Richert@fws.gov

Comment #	*The comment refers to the following*					Comments-Camp Ravenna dINRMP Update Feb 2014	Reviewer	Office of Reviewer	Action Taken to Address the Comment
	Chapter	Section	Page	Table	Fig				
1			Cover Page			Update years from 2013, here and throughout INRMP. Recommend "Beginning in FY2014" "FY14 to FY18"	J Rubinoff	ILE-CN	Changes made as requested. INRMP Updated through FY19 per USFWS approval (App. A).
2			Signature Page			There are a few places where "RTLS" needs to be changed to either "CRJMTC" or "Camp Ravenna", and some where "the RTLS" needs to be deleted. Suggest find and replace for whole document	J Rubinoff	ILE-CN	We already did a universal find and replace. Some of the RTLS's remain due to historical context of the text. No additional text changes made.
3			Signature Page			Under Michael Ahn, change 'NGB-ARE" to "ARNG-ILE". Also Col. Michael Ahn will be leaving at the end of May 2014. Replacement and updated signature will be Col. William M Myer	J Rubinoff	ILE-CN	Changes made as requested.
4		Paragraph 2	ES-2			Suggest stating in this paragraph that it's federally-owned property with concurrent jurisdiction.	J Rubinoff	ILE-CN	Changes made as requested.
5		Last Paragraph	ES-3			Suggest altering first sentence in last paragraph to include "...changes in the manner in which Camp Ravenna will manage the resources, therefore implementation will be a continuation..."	J Rubinoff	ILE-CN	Changes made as requested.
6		2nd Para.	1			Delete "Supplemental Guidance concerning INRMP Reviews, dated 1 November 2004" and replace with DoD Manual 4715.03 (25 Nov 13). Recommend looking over enclosures 2, 5, and 8 of the manual. The 2004 guidance was replaced with the newer manual.	J Rubinoff	ILE-CN	Concur. Changes made as recommended. The following text was added/modified: Department of Defense (DoD) Manual 4715.03, Integrated Natural Resources Management Plan (INRMP) Implementation Manual, 25 November 2013, provides procedures to prepare, review, update, and implement INRMP's in compliance with the Sikes Act. This manual replaces the DoD Office of the Deputy Undersecretary of Defense (DUSD), Supplemental Guidance concerning INRMP reviews, dated 1 November 2004. Identified in this guidance are general INRMP provisions including the requirement for each installation to conduct Planning Lvevel Surveys (PLSs) as the foundation for effective planning and decision making. INRMPs are required to be jointly reviewed by the United States Fish and Wildlife Service (USFWS), state conservation agency, and military proponent for operation and effect on a regular basis, but not less often than every five years. During the updating process, Enclosure 3 of respective manual gives each installation the ability to make INRMPs available electronically to partner agencies to expedite review and comment process. DoD Manual 4715.03 provides guidance on entering into cooperative agreements for management with governmental organizations as well as private individuals. Also included in this is DoD policy on wildland fire management which calls for the installation's Integrated Wildland Fire Management Plan (IWFMP) to be incorporated into the INRMP. DoD Manual 4715.03 differs from previous guidance in that it also calls for each installation to do what they can to address and mitigate the potential impacts of climate change. Furthermore, each installation is directed to include a discussion in the context of climate change in the INRMP and identify such potential impacts in the implementation table so that funding for projects designed to thwart climate change may be granted.
7		Last Paragraph	1			Regarding annual INRMP reviews with the wildlife agencies. We can't really require it because they are not obligated to review the INRMPs annually. We need to invite them to be involved in the annual reviews, but if they choose not to participate, that's on them.	J Rubinoff	ILE-CN	Concur. Text changed accordingly.
8		1.2	3			First bullet: Replace 'adequate wildlife habitat' with "significant natural resources'	J Rubinoff	ILE-CN	Changes made as requested.
9		1.2	3			Below Second Bullet: Add DoDM 4715.03 - INRMP Implementation Manual (25 Nov 13	J Rubinoff	ILE-CN	Changes made as requested.
10		1.2	3			7th Bullet: Delete "Memorandum, DUSD (Environment, Safety & Occupational Health [ES&OH]), Implementation of SAIA Amendments: Supplemental Guidance Concerning INRMP Reviews, 1 November 2004;" Document was superseded with 2013 INRMP Manual	J Rubinoff	ILE-CN	Changes made as requested.

Comment #	The comment refers to the following					Comments-Camp Ravenna dINRMP Update Feb 2014	Reviewer	Office of Reviewer	Action Taken to Address the Comment
	Chapter	Section	Page	Table	Fig				
11		1.4	4			Suggest explaining what 'concurrent legislative jurisdiction means with respect to OH ESA law, clean water law, or other laws that may require compliance beyond federal laws.	J Rubinoff	ILE-CN	Text updated. Consulted with NGOH-JA. Concurrent jurisdiction only applies to prosectution of crimal offenses. It enables state law enforcement to make arrest and prosectute offenses on federal property. It does not make all state and local oridances binding on the federal government/federal property. The OHARNG and Camp Ravenna are required to comply with state laws reguardless of jurisdiction. State surface water, wetland, hazwaste, environmental restoration, spill response, and other such laws are applicable to Camp Ravenna. Occassionally a law is not applicable such as the Ohio Uniform Environemntal Covenants Act, which requires restrictive covenants on cleanup sites and wetland mitigation sites. Such covenants cannot be placed on non-excess federal land. These special cases are learned through time as issues arise. We comply with State game laws because game and furbearers are taken off post by hunters, fishermen and trappers. The Ohio Endangered Plant Law (ORC 1518.02) states that "No person shall willfully root up, injure, destroy, remove, or carry away on or from public highways, public property, or waters of the state, or on or from the property of another, without the written permission of the owner, lessee, or other person entitled to possession, any endangered or threatened plant." This is applicable to Camp Ravenna. The state law prevents taking of state endangered plants without the landowner's permission. There is no prohibitionfrom taking State listed plants on federal property and no requirement to obtain State approval to do so. Concurrent jurisdiction does not impact this. The Ohio Endangered Animal Law restricts "the taking or possession of native wildlife, or any eggs or offspring thereof, that he (Chief, Division of Wildlife) finds to be threatened with statewide extinction" (ORC 1531.25). The state law is applicable to all land within Ohio including federal land, but does not define take nor does it have any requirement for habitat protection nor any requirements for consultation. The law applies directly to taking of animals, eggs and/or young. The OHARNG does not allow taking of State endangered species. We manage habitat diversity to support a vast array of species. Added some text in Sec 6.4 on State endangered species laws.
12		1.5.3	8			After subheading for "DoD Instruction 4715.03", Consider a new subheading with some principles/guidelines from the new DoDM 4715.03 (2013)	J Rubinoff	ILE-CN	Changes made to text as follows: Regarding Climate Change, DoD Manual 4715.03 states each installation shall: 1) Conduct a vulnerability assessment of natural resources of interest and how those vulnerabilities may impact the mission of the installation. 2) Develop common regional goals in cooperation with partner agencies. 3) Cooperate with regional conservation partnerships and alliances to share information and callaborate across jurisdictions.
13		2.4	16			Maps weren't included in this version so ignore comment as appropriate, but would be helpful in understanding the land use sections	E Beckley	ILE-CN	It was our intention to include the maps with the draft. This was an oversight on our part. Maps are in the final updated INRMP.
14		2.4.6	19			Are off-road maneuvers conducted in the 'Light Maneuver Area', and if so, do they need to be addressed for vegetation, wetlands, other impacts etc?	J Rubinoff	ILE-CN	Off road maneuvers is a broad term that can include a wide range of activities. Training is matched to the capability of the land to support the training. Vehicles are not permitted in streams or wetlands nor are troop activities concentrated in sensative habitats. There may be seasonal restrictions on use of certain training areas and certain types of training in a particular training area. Off road training (mounted and/or dismounted) may occur in light manuever areas on a limited basis as/if the land can support it. Routine and heavy impact off road training will not occur unless an area is prepared and capable to support it. The point of Section 2.4.6 is to basically identify general light maneuver training types of activities and to point out that pretty much all of Camp Ravenna can be used for light maneuvers of one type or another. Sections 5 and 6.5 specifically address how training is located and natural resources managed/protected. Also the Camp Ravenna Development and Training EA (2004) evaluates environmental impacts and provides guidance. Most training takes place on roads or built-up areas that have been used since 2000 or earlier. Training activity outside of what is normal and has known to have no impacts are evaluated on a case by case basis. Interaction between the Range Operations staff and ENV is good and a critical element of INRMP implementation.

Comment #	*The comment refers to the following*					Comments-Camp Ravenna dINRMP Update Feb 2014	Reviewer	Office of Reviewer	Action Taken to Address the Comment
	Chapter	Section	Page	Table	Fig				
15		2.4.7	19			"Heavy Maneuver Area". What kind of habitat - field, woods, savanna-like, and any impacts other descriptions needed?	J Rubinoff	ILE-CN	Text updated to include habitat types. The intent of this section is to identify the types of training and not to discuss environmental impacts. Management and impacts are discussed Sections 5 and 6.6 and the INRMP EA. See note for comment 14. Heavy manuever areas are more highly used by vehicles and equipment and more intensely managed. Uncontrolled off-road training is not done at Camp Ravenna. Limited off-road training is allowed when the ground is dry or frozen. Other "off-road" training is done on established trails. There are are two roadless areas used for "off-road" training - a tactical veihicle training area (grassland) and Engineer dig site (bare earth). Both have engineered storm water management systems and an NPDES permit for storm water discharge.
16		2.4.12	21			"The MRF Range is a FY16 MILCON project. The Fire and Maneuver Range is scheduled for in-house construction in FY14." Still scheduled for FY14 and FY16? If not, could remove years to keep vague.	J Rubinoff	ILE-CN	Concur. Text about MILCON dates deleted.
17		2.5	21			Second Paragraph: "Minor off-road vehicle training can be done when soil is dry." Section 2.4.7 talks about off-road heavy vehicle maneuvers. Is this considered minor?	J Rubinoff	ILE-CN	Additional text added to help clarify. As stated in Section 2.4.6 the entire Camp Ravenna property can be used for light maneuver training within limitations of the land to support such training. It is impossible to specifically identify all the limitations (wet areas and streams and AOCs, etc.) in each training location, so the general concepts are identified, i.e. no off-road training when the soil is wet. When the soil is dry, limited tracked vehicle off road training can occur in some light maneuver areas on Camp Ravenna. For instance we have a grassland training area we use as a field bivouac area and maneuver area for palidin howitzers. The unit practices driving the howitzers to a field site and setting it up and then moving to a new location. This can be done with limited to no damage to this area when the soil is dry. There is one unit with this need and they've been on site two times in the last 10 years. They also use our roads and various gravel pads. This is the type of off-road training that may occur in light maneuver areas. This also ties into our vegetation control plan regarding how we maintain and prepare these areas to support training while minimizing impacts to nesting birds. It requires active involvement of the natural resources manager and environmental office in managing the post.
18		2.5	21			Last Paragraph describes aircraft and personnel/cargo drops. Suggest considering for Northern Long-eared bat impacts as appropriate.	J Rubinoff	ILE-CN	Potential impacts will be considered in our informal confernce with the USFWS. We will look at impacts from all our mission activities. This will be placed in a new Appendix J. The intent of section 2.5 is just to identify the types of training done at Camp Ravenna. Impacts and management are addressed in Sections 5 and 6.
19		3.4.1.4	35	6		Wetland Planning level Surveys have not been conducted since 1999. Suggest considering these in the next FYs.	J Rubinoff	ILE-CN	Wetland PLSs are useless and a waste of money. In order for a wetland survey to have any value it needs to be a jurisdictional and isolated wetland delineation with ORAM scores. A broad general wetland PLS like the NWI maps or the one done by the USACE for ARNG in the past only confuse and mislead planners because they do not identify regulated wetlands. They identify obvious (sometimes) wetlands and plans are made by those who do not understand that a wetland PLS is not a legal delineation and then environmental has to fight to correct mis-information. The wetland PLSs that we have are fine. What we've done for the INRMP wetland map is make a compilation of all the PLS and jurisdictional and isolated wetland delineation data we have. We keep adding to the map. Even so, the wetland map is only a PLS because jurisdictioanl delineations are only valid for 5 years. We do not want or need to do a basewide jurisdictional delineation because there is no justification for the expense and no value added. Our best course of action is to do wetland delineations on a project specific basis and compile the data into a composite wetland PLS map. The current INRMP wetland map utilizes all previous PLSs, most current NWI data, and all jurisdiction and isolated wetland delineations to date.

Comment #	*The comment refers to the following*					Comments-Camp Ravenna dINRMP Update Feb 2014	Reviewer	Office of Reviewer	Action Taken to Address the Comment
	Chapter	Section	Page	Table	Fig				
20		3.4.1.4	36			Second Paragraph, last sentence describes delineated wetlands. Is this delineation still valid? If not, consider updated surveys and long term planning to manage for changes.	J Rubinoff	ILE-CN	The purpose of this last sentence is not to identify the number of acres that have been delineated via a jurisdictional and isolated wetland delineation but rather to identify that on average 13% of property that has been delineated is wetland. Short of doing a jurisdictional and isolated delineation of the entire post, this 13% figure can be used to get an idea of how many total acres of wetlands there are at Camp Ravenna. This is a question asked in the annual EQ submittal, which is really impossible to answer without a current jurisdictional and isolated wetland delineation of the entire post, which impractical and cost prohibitive to do.
21		4.2.4.1	48			"The 1999 Camp Ravenna Plant Communities Inventory identified a total of 13,330 acres o forest at the Camp Ravenna as opposed to 16,180 acres identified in the Camp Ravenna Timber Inventory" Does this 3,000 acre difference need an explanation?	E Beckley	ILE-CN	Text edited to provide an explanation. Basically the difference is in how the surveys were conducted and differences in how forest is defined in the classification systems.
22		4.2.4.1	48			References to Tables should be checked. Reference to Table 7. "The timber inventory acreages, listed in Table 7..." Table 7 is the mitigation sites table.	E Beckley	ILE-CN	This should say Table 8, not Table 7. Tables reviewed throughout documented and updated as needed.
23		4.2.4.4	50			1st paragraph. Reference to "American Tree Farm Systems' Certified Tree Farm Program" Are there any benefits other than the rating from AFF that should be listed as a benefit or as a feather in Ravenna's cap?	J Rubinoff	ILE-CN	The following text was added: "By being recognized as a Certified Tree Farm by the American Forest Foundation, the OHARNG is demonstrating to the public that we take proper management of the people's natural resources very seriously and that we are committed to doing so long-term. The Certified Tree Farm Program recognizes those exemplary landowners and land managers who go the extra mile to manage forest resources including water, wildlife and rare species. By managing the woodland resources at Camp Ravenna wisely and responsibly, we are also showing the public what good, sustainable forest management is all about and what a well managed forest looks like and provides for everyone to enjoy."
24		4.3.1	53			"northern long-eared bats". Need to break out NLEB and discuss listing, impacts, SOPs etc.	J Rubinoff	ILE-CN	Text corrected/updated to correctly identify all bats species identified at Camp RavennaThe discussion of impacts and management is in Sec 6 and Appendix J.
25		4.3.1	54			Any requirements for the star-nosed mole (Condylura cristata), the woodland jumping mouse(Napaeozapus insignis), and the pygmy shrew (Sorex hovi) as state listed species? If so, suggest listing those requirements.	J Rubinoff	ILE-CN	The only requirement is that we not take them or their young. See response to comment 11 above. Management of state listed species is discussed in Section 6.4.
26		4.4.1	59			Same as above comments on NLE bats, but need to break out NLEB and discuss listing, impacts, SOPs etc.	J Rubinoff	ILE-CN	Text added identifying NLEB. Management is identified in Section 6.4.1.7 and Appendix J.
27		4.4.1	59			For state listed species, Are there any non-discretionary requirements that Camp Ravenna has to follow to ensure compliance? If so, suggest listing those requirements.	J Rubinoff	ILE-CN	This section is just a list of resources. Management requirements are addressed in Section 6.4.

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	Chapter	Section	Page	Table	Fig				
28		5.1.1	65			Second Paragraph. Any potential impacts to NLE bats that need to be addressed in the minimum impact training section, such as from Aviation training (nap of the earth, hot and cold refueling, sling load, aerial drop, and simulated aerial spray training) is also considered minimum impact training.	J Rubinoff	ILE-CN	Text edited. Impacts are ultimately addressed in NEPA documents for training and construction projects. The following text added to Sec 5.1.1, "Most minimum impact training does not involve habitat manipulation or cutting of vegetation three inches in diameter or larger and therefore is not expected to impact Indian bat, northern long-eared bats, other bats species or any other federally listed species. Training that does disturb habitat or requires earth movement requires NEPA analysis. Impacts from these types of training are reviewed on a case by case basis." The following text added to Sec 5.1.2, "Environmental impacts from these types of training are evaluated in NEPA reviews. Management principles in the INRMP are used to avoid, minimize and mitiage impacts." The following text added to Sec 5.4. "The OHARNG has reviewed our training activities and evaluated potential impacts to federally listed rare species and obtained USFWS concurrence regarding management and restrictions required to comply with the ESA. This review is found in Appendix J and is used as management guidance in relation to federally listed species. The appendix also identifies Bald Eagle management strategies/restrictions. The review is updated as mission operations and/or federal species listings change." The need for appendix J is due to the pending listing of the NLEB and our desire to set management guidelines with the USFWS prior to its listing. As of this writing we are still working on our biological assessment and informal consultation with the USFWS. It will be inserted in the INRMP when complete. Not having this USFWS coordination does not currently impact INRMP implementation because the NLEB is not listed and we are required to comly with the ESA regardless. We have also included our bald eagle management guidance in appendix J.
29		6.4	79			"When practical, mowing and brush cutting will not be conducted between 15 July and 15 August to minimize disturbance on ground-nesting birds." July 15 is late compared to many areas, should this be April 15? Compare to section 6.7.2, Page 95 where its discussed in the semi-improved areas section	J Rubinoff	ILE-CN	15 April is correct. Text has been edited. Other information added regarding NLE bat management and applicability of state endangered species laws.
30		6.4.1	79			Same as above comments on NLE bats. Need to address NLEB and discuss listing, impacts, SOPs etc.	J Rubinoff	ILE-CN	Concur. NLE bat included. See response to comment 28.
31		6.4.1.1	79			Bald Eagles. Are there any current SOPs or requirements to prevent impacts/disturbance to Bald Eagles?	J Rubinoff	ILE-CN	Bald eagel management guidance is included in Appendix J and referenced in the text.
32		6.4.1.1	79			Recommend including bald eagle buffers or other methods for not disturbing nests. Information/language can be taken from: http://www.fws.gov/midwest/eagle/	E Beckley	ILE-CN	Concur. Information provided in Appendix J and referenced in the INRMP text.
33		6.4.1.4	81			Second Paragraph. "The OHARNG will conduct an installation wide Indiana bat survey every five years." This frequency may need to be revisited, According to the current NLEB guidelines, USFWS is considering a negative survey to be good for two field seasons.	J Rubinoff	ILE-CN	At Camp Ravenna, the USFWS considers our surveys good for 5 years for Indiana bat. This may very well change to two years if/when the NLEB is listed. For now the 5-year period is still valid. we are working with the USFWS on management implication due to the NLEB and will modify our survey methods and frequency if directed by the USFWS.
34		6.4.1.7	82			NLEB Section. As discussed over email, a separate appendix or other method may be best for addressing NLEB. Suggest including info as to how Ravenna plans on implementing mission activities that are in and around potential summer habitat. Also should mention, if known, if winter habitat occurs or is near the installation.	J Rubinoff	ILE-CN	Winter habitat does not occur on Camp Ravenna nor within 5 miles of Camp Ravenna. The text was edited and Appendix J added to address the NLE bat.
35		6.5.1	83			Last Paragraph. "A buffer zone will be established around these areas and no ground disturbing activity permitted". Have formal buffer zone requirements been created? If so, suggest inserting. If buffer requirements have not been finalized, suggest using a Wetland Rating System to categorize seeps/springs and designate buffers based off that.	J Rubinoff	ILE-CN	Formal buffer zones have not been established. We have not had the need to establish formal buffer zones because we have not had training activity in the vicinity of seeps, springs and adjacent wet areas. It is not a good or beneficial use of our limitied staff and time to identify all such areas on Camp Ravenna and designated formal buffers. This will be addressed on a case by case basis as/if needed in the future. The buffer size will be based on the size an quality of the wetland, seep, spring being protected and will be established for the duration of the activity

Comment #	*The comment refers to the following*					Comments-Camp Ravenna dINRMP Update Feb 2014	Reviewer	Office of Reviewer	Action Taken to Address the Comment
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36		6.5.2	85			Instead of slope, some locations are now rating wetlands/streams and using that as the system for designating buffers. So a small disturbed wetland might have a 30 ft buffer, while a large pristine site has a 200ft buffer. Not a requirement.	E Beckley	ILE-CN	These buffers are for activity within riparian zones not wetlands. They are general guidelines. There is no moratorium on activity within riparian areas. The environmental office may permit activity right up against the stream bank if the activity does not have negative impacts. We have very little to no activity within riparian areas so this is really a non-issue at this point. Concur that buffers and activity restriction should be based on quailty of the area being protected and not just slope. Reality is we will seldom have staff and time to qualify a wetland or a stream when supporting a training operation. These usually come quickly and we use our professional judgement. For construction project we usually have more time and require wetland delineations and wetland quality assessment using the Ohio Rapid Assessment Model (ORAM).
37		6.7.2	96			Second to last paragraph. "Timber is harvested adjacent to active power lines to minimize the chance for a power outage caused by uprooted trees during wind storms." Consider NLEB impacts or additional requirements from listing.	J Rubinoff	ILE-CN	Understood. Cutting trees adjacent to power lines does not nullify the requirement to comply with the ESA. See reply to comment 28.
38		6.7.3	97			Mowing/burning. Consider any new NLEB requirements.	J Rubinoff	ILE-CN	Mowing and burning have not yet negatively impacted the NLE bat. Our captures have steadily increased over the years at the same time maintenance and training activity have increased. The USFWS understands this and this will be identified in our analysis of impacts from training activities on the bat in Appendix J. See reply to comment 28.
39		6.8	98			For forest management, timber harvest, controlled burns, etc. consider NLEB requirements, winter habitat, etc.	J Rubinoff	ILE-CN	No NLEB winter habitat on site. Compliance with the ESA is specified as a requirement in Sec 6.8. Prefer to leave this section vague and put details in Appenidx J. See reply to comment 28.
40		6.8.5.8	109			First Bullet in 'Logging Operational Requirements'. Similar to wetland/riparian buffer questions above, Are the buffers for riparian zones below used for wetlands? And if so, is 50 ft enough of a buffer for vernal pools or significant wetlands with no slope? Suggest formalizing buffer requirements so they are an easy reference and easy to include in contracts.	E Beckley	ILE-CN	Application of buffers is done on a case by case basis. We harvest timber in forested wetlands so we cannot make blanket buffers around these areas. 50' is more than enough of a buffer around a wetland with no slope. The impact outside of the buffer will be some skidder traffic. It's not going to be totally disturbed or destroyed. The disturbance is minor and actually beneficial to forest regeneration and long term protection of the surface water resources. The biggest concern is the impacts the NLE bat restrictions will have on soils, wetlands and streams. We may need to revise and firm up our buffers depending upon the impacts we see. We are being forced to harvest timber in saturated soil conditions that we previously required loggers to avoid. The soil is going to be a mess complying with the NLE bat restrictions. This will be re-evaluated as we go foward with our new harvest time paradigm. Use of a slope and a distance is an easy referance and easy to include in contracts.
41		6.8.6	110			Same NLEB questions as above. Herbicide impacts? Non-merchantable tree felling, etc.	J Rubinoff	ILE-CN	Herbicide is mostly cut surface treatment - highly controlled. No logical reason to anticipate impacts on bats and no evidence from past activity. Non-merchantable felling will have to be modified. We will work this out in our informal conference with the USFWS and include it in Appendix J. Text has been added to state ESA requirements must be followed. "Requirements for threatened and endangered species sucha as the timing of tree felling and ensuring adequate habitat trees are left standing or created by girdling are taken into consideration when implementing TSI operations. Minimum amounts of herbicides are used utilizing cut stump, basal bark, or girdle and fill application methods, which prevent non-target application."
42		6.8.9.3	116			Second Sentence "The Northern long-eared bat is proposed for listing as federally endangered in 2014. It is present on Camp Ravenna and will require special management emphasis if it is listed." Could include a general sentence to satisfy USFWS when they review this, something like: "Procedures for logging will be updated in coordination with USFWS upon final listing of the Northern Long-eared bat."	E Beckley	ILE-CN	The USFWS has already indicate no comment on the updated INRMP. A statement has been added to the text. "Procedures and restrictions on timber management operation and other activities at Camp Ravenna to facilitate management of the Northern long-eared bat are contained in Appendix J." Additional text added to paragraph 2, "Now that the Northern long-eared bat is proposed for listing as federally endangered in 2015, restrictions must be implemented on when trees three (3) inched in diameter and greater can be felled. Trees cannot be felled between 1 April and 30 September. Further evaluation of logging operation and other restrictions due to the Northern long-eared bat are included in Appendix J. These restrictions also serve to protect he Indiana bat."

Comment #	*The comment refers to the following*					Comments-Camp Ravenna dINRMP Update Feb 2014	Reviewer	Office of Reviewer	Action Taken to Address the Comment
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43		6.10	119			Same NLEB questions as above. Burning impacts, etc.	J Rubinoff	ILE-CN	Preliminary discussions with the USFWS indicate that burning will most likely not be an issue due to time of year (March or October) and because we do so little of it and past fires do not seem to have impacted the NLE bat (increased captures over the years). Added, "USFWS guidelines regarding the Northern long-eared bat will be followed when burning" to 6.10.2.2
44		6.15	129			Under "Natural Resource Law Enforcement", Suggest Referencing DoD Instruction 5525.17, dated October 17, 2013 "Conservation Law Enforcement Program (CLEP)". Instruction lists various requirements for law enforcement and INRMPs but leaves it open for State, Fed, Local relationships.	E Beckley	ILE-CN	Text modified to clarify. "There is no onsite military law enforcement support at Camp Ravenna. Enforcement of environmental requirements is carried out by the Camp Ravenna Environmental and Range Operations staffs by providing oversight and guidance of activities taking place on post. Violations are reported up the chain of command for action by Federal, State or local law enforcement agencies as appropriate. Most issues that require law enforcement are related to the Camp Ravenna public deer hunts. The Ohio Division of Wildlife provides law enforcement officeres for this task at no charge to the OHARNG. Enforcement actions and notices of violations related to most other environmental regulations are mostly issued by the Ohio EPA. The Ohio Department of Agriculture is the regulatory and enforcemen agent for the Ohio Pesticide Law."
45		7	130			Objective 1.1. Suggest making this objective measurable to the best you can. Could include dates such as; "annually initiate programs" or "within the 5-yr window of the plan, initiate ? programs and projects… etc	J Rubinoff	ILE-CN	Added "Annually implement programs and projects" to objective 1.1. Added project 1.2.2 to include NR awarenss training in Camp Ravenna annual environmental training given to all personnel stationed at Camp Ravenna.

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NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

ARNG-ILE 23 MAY 14

MEMORANDUM FOR: Ohio Army National Guard (OHARNG), Camp Ravenna Joint Military Training Center (ATTN: Mr. Tim Morgan, Env. Supervisor), 1438 State Route 534 SW, Newton Falls, OH 44444

SUBJECT: Army National Guard (ARNG) Directorate Review of the Integrated Natural Resource Management Plan (INRMP) Update for Camp Ravenna Joint Military Training Center, OHARNG

1. References:

a. The Sikes Act (16 U.S.C 670 et seq)

b. Handbook, Guidance on Preparing Environmental Documentation for Army National Guard Actions in Compliance with the National Environmental Policy Act (NEPA) of 1969, OCT 11.

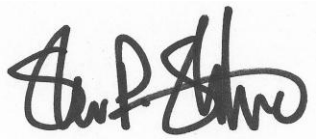
c. Memorandum, ARNG-ILE, 09 APR 12, Guidance for the Creation, Implementation, Review, and Revision and Update of Integrated Natural Resources Management Plans (INRMPs).

d. Army Regulation 200–1, Environmental Protection and Enhancement, DEC 07.

2. The ARNG Directorate staff reviewed the referenced INRMP. Attached is the errata sheet containing ARNG-ILE comments.

3. Please review the changes requested in the errata and return to the ARNG Directorate for final approval along with the appropriate level of NEPA documentation.

4. The point of contact for this action is Eric Beckley, Sikes Act Program Manager, 703-601-7036 or via email at eric.r.beckley.civ@mail.mil.



Encl

STEVE P. STADELMAN
Chief, Conservation Branch

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

March 24, 2014

Brian Riley
OHARNG Natural Resources Manager
Camp Ravenna Joint Military Training Center
1438 State Route 534 SW
Newton Falls, Ohio 44444

Dear Mr. Riley,

TAILS#: 03E15000-2014-TA-0860

This is in response to your March 6, 2014 Draft Updated Integrated Natural Resources Management Plan (INRMP) for Camp Ravenna Joint Military Training Center (Camp Ravenna). The Service has reviewed the draft updates to the INRMP, and at this time, we have no comments.

As you are aware, on October 2, 2013 the northern long-eared bat (*Myotis septentrionalis*) was proposed for listing as endangered under the Endangered Species Act of 1973, as amended. We anticipate that a final rule officially listing this species will be published in the Federal Register in October 2014. Should the listing be finalized, we understand that Camp Ravenna intends to initiate programmatic consultation regarding this species and will incorporate the results of the consultation in the INRMP.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (ESA), as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy.

If you have questions, or if we may be of further assistance in this matter, please contact Angela Boyer at extension 22 in this office.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Field Supervisor

cc: Nathan Reardon, ODOW (email)
Paul Richert, USFWS-RO, Region 3 (email)

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From: Boyer, Angela [angela_boyer@fws.gov]
Sent: Monday, December 01, 2014 9:59 AM
To: Riley, Brian P NFG (US)
Subject: Fwd: Camp Ravenna INRMP contact (UNCLASSIFIED)
Attachments: INRMP signature page_unsigned.PDF; USFWS_INRMP_letter_24march2014.pdf; smime.p7s

Brian,

This ended up back with me. Yes, USFWS will approve you updating the INRMP through FY19.

Sincerely,
Angie

---------- Forwarded message ----------
From: Riley, Brian P NFG (US) <brian.p.riley17.nfg@mail.mil>
Date: Tue, Nov 25, 2014 at 4:23 PM
Subject: Camp Ravenna INRMP contact (UNCLASSIFIED)
To: "Ohio@fws.gov" <Ohio@fws.gov>

Classification: UNCLASSIFIED
Caveats: NONE

USFWS,

I am writing with a question regarding the Camp Ravenna Integrated Natural Resources Management Plan (INRMP). As of December 19, 2012, Mr. David Henry was our USFWS contact person, however, I understand that his position is vacant so I am throwing this general INRMP question out to be fielded by someone familiar with the INRMP process.

In the updated Camp Ravenna INRMP, the heading of the signature page reads that the updated INRMP begins in Federal Fiscal Year 2013 (attached). Now that we are in Federal Fiscal Year 15, we are finally finishing up the updated INRMP which will be finalized with the inclusion of the approved Biological Assessment for the NLEB. My question pertains to the year of the INRMP signature page heading. I would like to know if the USFWS will approve us updating the INRMP for two more years (through FY19) or if we need to just keep the updated INRMP as beginning Fiscal Year 2013? Since we are already two years into the updated INRMP and are implementing the INRMP in accordance with approval from the USFWS at the 19 DEC 2012 Review for Operation and Effect (the meeting attended by Mr. David Henry) as well as your response of "no comments" to our draft updated INRMP dated 24 MAR 2014 (also attached), we would like to extend the updated INRMP through FY19.
This would mean holding our next Review for O&E meeting at the start of Federal Fiscal Year 20.

Please don't hesitate to contact me if any of this is unclear or if you have any questions.

Thank you,

Brian

Brian Riley
Natural Resources Manager
Ohio Army National Guard
Camp Ravenna Joint Military Training Center

1438 State Route 534 SW
Newton Falls, Ohio 44444
Phone: (614) 336-4564
Email: brian.p.riley17.nfg@mail.mil

Classification: UNCLASSIFIED
Caveats: NONE

Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

Office of Real Estate
Paul R. Baldridge, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6649
Fax: (614) 267-4764

May 15, 2014

Brian P. Riley
Ohio Army National Guard
Camp Ravenna Joint Military Training Center
1438 State Route 534 SW
Newton Falls, Ohio 44444

Re: 14-293; Ohio ANG -Draft Updated Integrated Natural Resources Management Plan (INRMP) - Camp Ravenna

Project: The purpose of the updated Integrated Natural Resource Management Plan (INRMP) is to set appropriate and adequate guidelines for conserving and protecting the natural resources of Camp Ravenna while facilitating and supporting the military mission.

Location: The project is located in Ravenna Township, Portage and Trumbull Counties, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

ODNR has no substantive comments on the revised INRMP. Below, for your reference, we have included standard comments for threatened and endangered species for this area of the state.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

Camp Ravenna is within the range of the Indiana bat (*Myotis sodalis*), a state and federally endangered species. The following species of trees have relatively high value as potential Indiana bat roost trees: Shagbark hickory (*Carya ovata*), Shellbark hickory (*Carya laciniosa*), Bitternut hickory (*Carya cordiformis)*, Black ash (*Fraxinus nigra*), Green ash (*Fraxinus pennsylvanica*), White ash (*Fraxinus americana*), Shingle oak (*Quercus imbricaria*), Northern red oak (*Quercus rubra*), Slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), Eastern cottonwood (Populus deltoides), Silver maple (*Acer saccharinum*), Sassafras (*Sassafras albidum*), Post oak (*Quercus stellata*), and White oak (*Quercus alba*). Indiana bat habitat consists of suitable trees that include dead and dying trees with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees with exfoliating bark, cavities, or hollow areas formed from

broken branches or tops. If suitable trees occur within the project area, the Division of Wildlife recommends that these trees be conserved. If suitable habitat occurs on the project area and trees must be cut, the Division of Wildlife recommends cutting occur between October 1 and March 31. If suitable trees must be cut during the summer months, the Division of Wildlife recommends a net survey be conducted between June 1 and August 15, prior to cutting. Net surveys should incorporate either nine net nights per square 0.5 kilometer of project area, or four net nights per kilometer for linear projects. If no tree removal is proposed, a project is not likely to impact this species.

Camp Ravenna is within the range of the eastern massasauga (*Sistrurus catenatus*), a state endangered and a federal candidate snake species. The eastern massasauga uses a range of habitats including wet prairies and wetlands, as well as drier upland habitat.

Camp Ravenna is within the range of the Iowa darter *(Etheostoma exile)*, a state endangered fish, the northern brook lamprey *(Ichthyomyzon fossor*), a state endangered fish, the mountain brook lamprey (*Ichthyomyzon greeleyi*), a state endangered fish, and the lake chubsucker (.*Erimyzon sucetta*), a state threatened fish. The DOW recommends no in-water work in perennial streams at least April 15 to June 30 to reduce impacts to indigenous aquatic species and their habitat. If there is no in-water work, a project is not likely to impact these species.

Camp Ravenna is within the range of the clubshell (*Pleurobema clava*), a state endangered and federally endangered mussel, the snuffbox (*Epioblasma triquetra*), a state endangered and federally endangered mussel, and the black sandshell (*Ligumia recta*), a state threatened mussel, and the eastern pondmussel *(Ligumia nasuta*), a state endangered mussel. If there is no in-water work, a project is not likely to impact these species.

Camp Ravenna is within the range of the black bear (*Ursus americanus*), a state endangered species. Due to the mobility of this species, a project is not likely to impact this species.

Camp Ravenna is within the range of the spotted turtle (*Clemmys guttata*), a state threatened species. This species prefers fens, bogs and marshes, but also is known to inhabit wet prairies, meadows, pond edges, wet woods, and the shallow sluggish waters of small streams and ditches.

Camp Ravenna is within the range of the northern harrier (*Circus cyaneus*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. If this type of habitat will be impacted, construction should not occur in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, a project is not likely to impact this species.

Camp Ravenna is within the range of the American bittern (*Botaurus lentiginosus*), a state endangered bird. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. If this type of habitat will be impacted, construction must be avoided in this habitat during the species' nesting period of May 1 to July 31. If this type of habitat will not be impacted, a project is not likely to impact this species.

Camp Ravenna is within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered bird. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to July 31. If this type of habitat will not be impacted, a project is not likely to impact this species.

The ODNR Natural Heritage Database has no records for rare or endangered species at this project site. We are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife areas, nature preserves, parks or forests, national wildlife refuges or other protected natural areas within the project area. Our inventory program does not provide a complete survey of Ohio wildlife, and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area.

ODNR appreciates the opportunity to provide these comments. Please contact John Kessler at (614) 265-6621 if you have questions about these comments or need additional information.

John Kessler
ODNR Office of Real Estate
2045 Morse Road, Building E-2
Columbus, Ohio 43229-6693
John.Kessler@dnr.state.oh.us

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THE ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARTY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

November 19, 2012

John Kessler, P.E.
Ohio Department of Natural Resources
2045 Morse Rd.,
Columbus, OH 43229-6605
614-265-6621
John.Kessler@dnr.state.oh.us

Subject: Camp Ravenna Joint Military Training Center Integrated Natural Resource Management Plan Review for Operation and Effect Kick-off Meeting

Mr. Kessler:

The Ohio Army National Guard (OHARNG) intends to conduct the five year Review for Operation and Effect (ROE) of the March 2008 Integrated Natural Resources Management Plan (INRMP) for the Camp Ravenna Joint Military Training Center (CRJMTC; Camp Ravenna), in accordance with the Sikes Act and the 9 April 2012 Army National Guard Directorate, Environmental Programs Division (ARNG-ILE) Guidance for Creation, Implementation, Review, and Revision and Update of Integrated Natural Resources Management Plans. The INRMP review is required by Army Policy to reflect the mutual agreement of the U.S. Fish and Wildlife Service (USFWS) and the State fish and wildlife agency, in Ohio the Ohio Department of Natural Resources (ODNR) Division of Wildlife (DOW), concerning conservation, protection and management of fish and wildlife resources. The review will determine if the INRMP is being implemented to meet the requirements of the Sikes Act and contributing to the conservation and rehabilitation of natural resources at Camp Ravenna while providing for no net loss of military training capability.

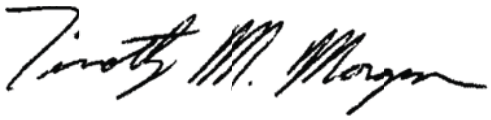
The OHARNG has conducted a number of detailed environmental, biological, and cultural resource surveys over the last several years and has a wealth of information on hand about flora and fauna species, plant communities, wetlands, surface water quality, topography, and cultural resources. The INRMP must incorporate this new data and any additional comments or procedural changes that result from the coordination between Camp Ravenna and the USFWS and ODNR.

In order to begin the review process, a one-day agency coordination meeting is scheduled for 10:30 a.m., **December 19, 2012** at the Camp Ravenna Environmental Office, 1438 State Route 534 SW, Newton Falls, OH 44444. A meeting agenda, contact list, and site map are attached.

Please take some time and review the INRMP prior to attending the meeting. You are welcome to review and comment on any portion of the INRMP. In order to aid in your review a table, Table 1, is attached that identifies sections of the INRMP that may be of particular interest to each agency. Also attached is a table detailing projects that have been implemented to since the 2008 INRMP (Table 17 Implementation Projects 2008-2012).

We look forward to and welcome your participation in the INRMP review process. Please send notification of your attendance to Jamie Willaman at EnviroScience at jwillaman@enviroscienceinc.com or via phone at (330) 688-0111. If you have any questions concerning this request, please do not hesitate to contact Jamie Willaman or the undersigned at (614) 336-6568. Electronic copies of the March 2008 INRMP will be made available upon request.

Sincerely,



Timothy M. Morgan, CF
Environmental Supervisor
Camp Ravenna Joint Military Training Center

Enc: Meeting Agenda
Contact List
Meeting Site Map
Table 1; Agency Review Sections
Table 17; Implementation Projects 2008-2012

Cc: Karl Gebhardt

THE ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARTY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

November 19, 2012

Mary Knapp, Ph.D.
Field Supervisor
U.S. Fish & Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230
614-416-8993 x12
mary_m_knapp@fws.gov

Subject: Camp Ravenna Joint Military Training Center Integrated Natural Resource Management Plan Review for Operation and Effect Kick-off Meeting

Dr. Knapp:

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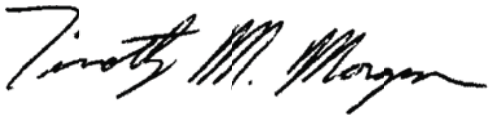

Timothy M. Morgan, CF
Environmental Supervisor
Camp Ravenna Joint Military Training Center

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Cc: Paul Richert

THE ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARTY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

November 19, 2012

LTC William Meade
CRJMTC
1438 State Route 534 SW
Newton Falls, OH 44444
william.e.meade.mil@mail.mil

Subject: Camp Ravenna Joint Military Training Center Integrated Natural Resource Management Plan Review for Operation and Effect Kick-off Meeting

LTC Meade:

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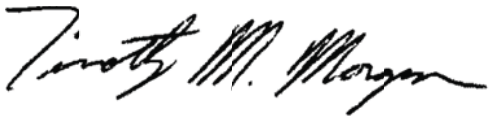

Timothy M. Morgan, CF
Environmental Supervisor
Camp Ravenna Joint Military Training Center

Enc: Meeting Agenda
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Cc: Timothy Morgan
Brian Riley

THE ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARTY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

November 19, 2012

Scott Peters
Wildlife Management Supervisor
Ohio Division of Wildlife
912 Portage Lakes Drive
Akron, Ohio 44319
(330) 644-2293
Scott.Peters@dnr.state.oh.us

Subject: Camp Ravenna Joint Military Training Center Integrated Natural Resource Management Plan Review for Operation and Effect Kick-off Meeting

Mr. Peters:

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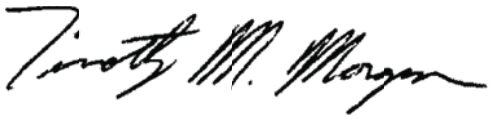

Timothy M. Morgan, CF
Environmental Supervisor
Camp Ravenna Joint Military Training Center

Enc: Meeting Agenda
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Cc: Scott Zody

INRMP Review Meeting

19 December 2012
1030 hours- 1300 hours EST
OHIO ARMY NATIONAL GUARD
CAMP RAVENNA JOINT MILLITARY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, Ohio 44444

Agenda

1030 Welcome and Introductions

1045 Overview of INRMP Function Review Requirements

1100 Camp Ravenna Overview
- Mission and Training Requirements
- Mission/Training Changes Since 2008 INRMP
- Future Development

1130 INRMP Review for Operation and Effect
- Review Metrics (slide)
- Is the INRMP working?
  - Has a net loss of training capability occurred due to implementation of the INRMP?
  - Are recurring natural resources conservation management requirements and natural resources compliance needs met?
  - Areas that need improvement

1230 Open Discussion of Natural Resource Management Issues, Concerns, Suggestions, or Recommendations
- Indiana Bat Management
- State Endangered Species Laws
- Any Additional Questions, Comments, or Concerns

1300 Recommendation
- Update INRMP
- Revise INRMP

Contacts

OHARNG

Timothy M. Morgan, CF
Fort Ohio Environmental Supervisor
CRJMTC
1438 State Route 534 SW
Newton Falls, OH 44444
614-336-6568
Timothy.m.morgan.nfg@mail.mil

Brian P. Riley
Natural Resource Manager
CRJMTC
1438 State Route 534 SW
Newton Falls, OH 44444
brian.p.riley3.ctr@mail.mil

LTC William Meade
CRJMTC
1438 State Route 534 SW
Newton Falls, OH 44444
william.e.meade.mil@mail.mil

USFWS

Mary Knapp, Ph.D.
Field Supervisor
U.S. Fish & Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230
614-416-8993 x12
mary_m_knapp@fws.gov

David Henry
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230
614-416-8993 x27
david_henry@fws.gov

Paul Richert
Federal Projects Coordinator
U.S. Fish and Wildlife Service
5600 American Blvd. West, Suite 990
Bloomington, MN 55437-1458
Paul_Richert@fws.gov

ODNR DOW

Scott Zody
Chief
Ohio Division of Wildlife
2045 Morse Rd., Bldg. G
Columbus, Ohio 43229-6693
Scott.Zody@dnr.state.oh.us

Scott Peters
Wildlife Management Supervisor
Ohio Division of Wildlife
912 Portage Lakes Drive
Akron, Ohio 44319
(330) 644-2293
Scott.Peters@dnr.state.oh.us

ODNR DWSR

Karl Gebhardt
Chief
Ohio Department of Natural Resources
2045 Morse Rd.,
Columbus, OH 43229-6605
karl.gebhardt@dnr.state.oh.us

John Kessler, P.E.
Ohio Department of Natural Resources
2045 Morse Rd.,
Columbus, OH 43229-6605
614-265-6621
John.Kessler@dnr.state.oh.us

EnviroScience

Jamie Willaman
Senior Project Manager
3781 Darrow Road
Stow, Ohio 44224
330-688-0111
jwillaman@enviroscienceinc.com

Danielle Papineau
GIS Analyst
3781 Darrow Road
Stow, Ohio 44224
330-688-0111
dpapineau@enviroscienceinc.com

Camp Ravenna INRMP Review Meeting Location
1438 State Route 534 SW
Newton Falls, OH 44444

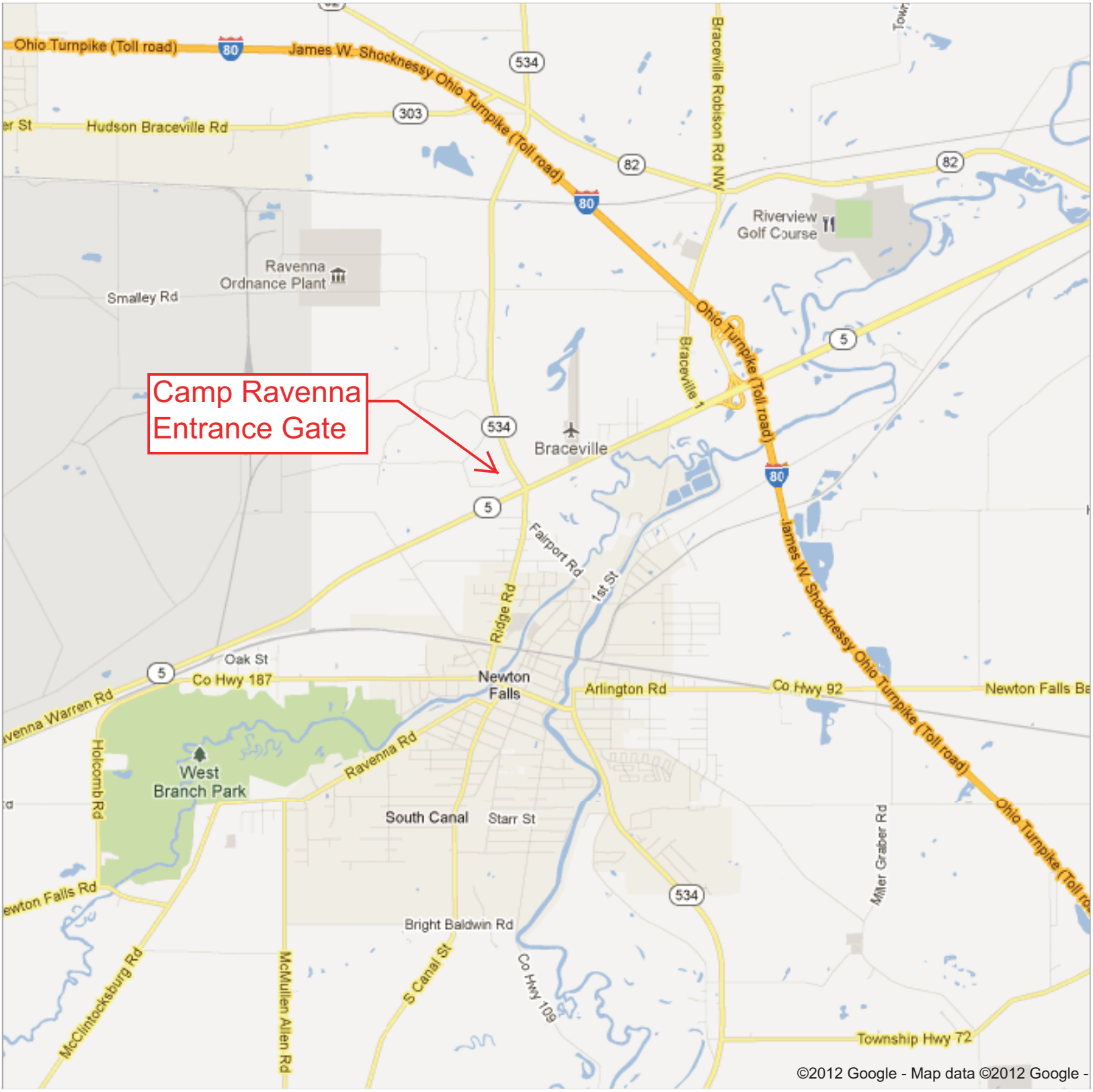

Table 1. Camp Ravenna INRMP Review for Operation and Effect
ODNR Agency Review Guidance

INRMP Section	Concerning
4.4	Threatened and Endangered Species
4.4.1	Federal and State Listed Species at Camp Ravenna
4.4.2	Other Biological Items of Interest
4.4.3	Special Interest Areas
5.0	Mission Impacts on Natural Resources
6.3	Fish and Wildlife Management
6.3.1	Cooperative Wildlife Management Efforts
6.3.2	Fish Management
6.3.3	WhiteTail Deer Management
6.3.4	Small Game Management
6.3.5	Nuisance Wildlife and Wildlife Diseases
6.3.6	Beaver Management
6.4	Management of Threatened and Endangered Species
6.4.2	Ohio State Listed Species
6.8	Forest Ecosystem Management
6.8.9	Special Forest Management Considerations
6.8.9.3	Rare Species, Migratory Birds and Unique Habitats
6.8.9.4	General Wildlife Considerations
6.9	Grassland and Old Field Management
6.13	Outdoor Recreation
6.13.1	White Tailed Deer Hunting
6.13.2	Waterfowl Hunting
6.13.3	Turkey Hunting
6.13.4	Small Game Hunting
6.13.5	Trapping
6.13.6	Fishing
6.13.8	Watchable Wildlife Program
6.15	Natural Resource Law Enforcement
7.0	Management Objectives and Goals
8.0	Natural Resource Program Implementation

Table 17. Implementation Projects 2008 – 2012*													Last Updated 1 November 2012
Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Annual Breeding Bird Survey	NO	CONS-1	Funds will be used to conduct an annual breeding bird survey on established breeding bird routes. The survey will identify nesting birds at the RTLS in accordance with established national breeding bird survey protocols and identify significant upward or downward trends in the breeding bird population.	Forestry Reimbursable	NA	ESA, Sikes Act, Army Regulation	2008	Ongoing	$2,500	yes	$2,200.00	Complete	
							2009	Ongoing	$2,500	yes	$2,237.40	Complete	
							2010	Ongoing	$2,500	yes	$0.00	Complete	Included with basewide bird survey OH DNR
							2011	Ongoing	$2,500	No	$0.00	Complete	Modified continuation of 2010 bird survey (volunteer)
							2012	Ongoing	$2,500	yes	$2,456.00	Complete	
Forest Management	NO	CONS -2	Funds will be used for forestry related supplies and equipment and timber stand improvement.	Forestry Reimbursable	NA	Sikes Act, Army Regulation	2008	Ongoing	$15,300	yes	$15,169.08	Complete	249 acres
							2009	Ongoing	$15,300	yes	$14,457.22	Complete	226 acres
							2010	Ongoing	$15,400	yes	$28,274.36	Complete	421 acres
							2011	Ongoing	$15,400	yes	$12,250.00	Complete	175 acres
							2012	Ongoing	$15,500	yes	$22,200.00	In Progress	300 acres
Forestry Archeology Surveys	NO	CONS-3	Funds will be used for archeological surveys in support of timber harvest activities during the planning period FY07 through FY 2011.	Forestry Reimbursable	NA	NHPA of 1966, Sikes Act, Army Regulation	2008	Ongoing	$55,000	yes	$31,015.65	Complete	576 acres
							2009	Ongoing	$55,000	yes	$28,100.00	Complete	388 acres
							2010	Ongoing	$55,000	yes	$31,709.36	Complete	560 acres
							2011	Ongoing	$55,000	yes	$30,243.00	Complete	388 acres
							2012	Ongoing	$55,000	yes	$33,602.00	In Progress	Contract award under dispute. Acres unknown.
Hunting, Fishing, and Trapping Administration	NO	CONS-4	Funds will be used cover administrative costs associated with hunting, fishing, and trapping programs.	Sikes Act User Fees (Appropriation 5095)	NA	Sikes Act, Army Regulation	2008	Ongoing	$600	yes	$0	Complete	User fee funding not used.
							2009	Ongoing	$700	yes	$0	Complete	User fee funding not used.
							2010	Ongoing	$700	yes	$0	Complete	User fee funding not used.
							2011	Ongoing	$700	yes	$0	Complete	User fee funding not used.
							2012	Ongoing	$800	yes	$0	Complete	User fee funding not used.
Deer Hunt Area Management	Yes	CONS-5	Funds will be used for supplies and labor to maintain hunt area boundary markings, hunt signs, and to mow and maintain access lanes in hunt areas.	Conservation (Appropriation 2065, Master Cooperative Agreement, Sikes Act User Fees (Appropriation 5095)	OH430090004	Sikes Act, Army Regulation	2008	Ongoing	$10,000	no	$0.00	Partial	Volunteer labor and partial execution
							2009	Ongoing	$10,000	no	$0.00	Partial	Volunteer labor and partial execution
							2010	Ongoing	$10,000	yes	$10,000.00	Complete	Volunteer labor + funded in FY10 end of year and some mowing done in conjunction with grassland habitat mowing.
							2011	Ongoing	$10,000	no	$0.00	Partial	Volunteer labor and partial execution
							2012	Ongoing	$10,000	yes	$0.00	Partial	All STEP funding used for grassland management. Volunteer labor used for hunt area management.
Grassland Management	Yes	CONS-6	Funds will be used to support conversion of non-native grasslands to native grasses and annual management such as mowing and spot treatment with herbicides as necessary remove woody encroachment. Mowing will be done in areas were burning is not possible. Up to 100 acres will be done per year as funds permit.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090004	Sikes Act, Army Regulation, Migratory Bird Treaty Act, N.American Waterfowl Mgmt. Plan	2008	Ongoing	$20,000	yes	$20,000.00	Complete	$20,000 FY07 DOD Reserve Acct. Project, 12 acres. STEP project not funded in FY08.
							2009	Ongoing	$20,000	no	$0.00	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$20,000	yes	$23,900.00	Complete	STEP Projeect funded end of year UFR. 152 acres mowed/brush cut. Total cost $33,900.
							2011	Ongoing	$20,000	no	$0.00	Incomplete	Ongoing next year pending funding.
							2012	Ongoing	$20,000	yes	$97,083.50	In Progress	Grassland and Young Forest Habitat management.
Pond Maintenance and Repair	Yes	CONS -7	Funds will be used for the maintenance of access routes, water control structures, dikes, and dams on ponds and wetland areas.	Conservation (Appropriation 2065, Master Cooperative Agreement, Sikes Act User Fees (Appropriation 5095)	OH430090005	CWA, Sikes Act, Army Regulation	2008	Ongoing	$20,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$20,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2011	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
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Table 17. Implementation Projects 2008 – 2012*													Last Updated 1 November 2012
Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Nuisance Wildlife Management	Yes	CONS -8	Funds will used to keep the three main streams (Hinkley Creek, South Fork Eagle Creek, and Sand Creek) free from beaver dams so as not to degrade current high quality of stream habitats. Beaver will be trapped during trapping season and dams mechanically removed as necessary. Beaver and floodings in side channels will also be removed only if damaging government facilities and impeding mission capability. Other nuisance wildlife will be controlled as necessary.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090007	CWA, Sikes Act, Army Regulation	2008	Ongoing	$10,000	no	$0	Partial	Partial implementation via beaver trapping and in house staff
							2009	Ongoing	$10,000	no	$0	Partial	Partial implementation via beaver trapping and in house staff
							2010	Ongoing	$10,000	no	$0	Partial	Partial implementation via beaver trapping and in house staff
							2011	Ongoing	$10,000	no	$0	Partial	Partial implementation via beaver trapping and in house staff
							2012	Ongoing	$10,000	yes	$10,000	Partial	Unable to execute funds due to lack of staff. Funds used for grassland habitat management. Partial implementation via beaver trapping and in house staff.
Natural Resources GIS Support	Yes	CONS -9	Funds will be used to link deer hunt data, breeding bird data, and other NR data to GIS, to produce maps, and to acquire equipment, data and aerial photos.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH000060013	Sikes Act, Army Regulation	2008	Ongoing	$36,500	no	$0	Partial	INRMP update some data, DIMR-GIMS
					OH430060005		2009	Ongoing	$20,000	no	$0	Partial	Some DIMR-GIMS support
					OH430060017		2010	Ongoing	$36,500	no	$0	Partial	OH430060005 ($10,000) for data creation disapproved for FY10. New aerial photos OH000060013 centrally funded by NGB ($25,000). OH430060017 ($1,500) for GIS equipment and OH430090002 ($15,000) for part time GIS employee not funded.
							2011	Ongoing	$20,000	no	$0	Partial	Some DIMR-GIMS support
					OH430090002		2012	Ongoing	$36,500	yes	$15,000	Partial	Unable to execute STEP funds due to lack of staff. Some DIMR-GIMS support.
Seasonal NR Employee	Yes	CONS-10	Funds will be used to hire a seasonal natural resources employee.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430060001	Sikes Act, Army Regulation	2008	Ongoing newly listed project	$12,000	yes	$4,295.52	Partial	1 month of service
							2009	Ongoing	$12,000	yes	$0	Incomplete	Unable to execute. Ongoing next year.
							2010	Ongoing	$12,000	yes	$0	Incomplete	Unable to execute. Ongoing next year.
							2011	Ongoing	$27,000	yes	$0	Incomplete	Low priority in reduced budget.
							2012	Ongoing	$28,000	yes	$100,012.68	Complete	Full-time contracted NR Manager
Integrated Wildland Fire Management Plan	Yes	CONS -11	Funds will be used to develop and update an Integrated Wildland Fire Management Plan.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430060012	Sikes Act, Army Policy	2008	New	$0	no	$0	Complete	NGB National Contract with USFS. Plan completed in 2009.
							2009	Ongoing	$0	no	$0	Incomplete	2009 Plan lacks burn schedule and estimated costs. 2010 funds requested to update plan. Not funded.
							2010	Ongoing	$15,000	no	$0		Not funded.
							2011	Ongoing	$15,000	no	$0		Not funded.
							2012	Ongoing	$0	no	$0		No funds requested due to lack of staff to implemt. $15,000 approved for FY13.

Table 17. Implementation Projects 2008 – 2012*													Last Updated 1 November 2012
Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Invasive/ Noxious Weed Management	Yes	CONS-12	Funds will be used to control purple loosestrife, multiflora rose, Russian olive, autumn olive, and other invasive / noxious weeds identified throughout the INRMP implementation period.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090005	Sikes Act, Army Regulation, OAC 901:5-37-01, *Prohibited noxious weeds*	2008	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$12,000	no	$0	Partial	Inhouse Phragmites control at Rt 80 wetland mitigation site and Japanese knotweed on Wadsworth Rd.
							2010		$12,000	no	$0	Partial	Inhouse as time and material permit.
							2011	Ongoing	$12,000	no	$0	Partial	Inhouse Phragmites control at Rt 80 wetland mitigation site and Japanese knotweed on Wadsworth Rd.
							2012		$22,000	yes	$41,447.00	In Progress	Allanthus, Japnese Knotweed control and invasive species road survey.
Forest Inventory	No	CONS-13	Funds will be used to obtain a GIS compatible forest inventory of CRJMTC. The work will include revising the existing GIS Forest Management map and linking the new forest inventory data to the map.	Forestry Reimbursable, Conservation (Appropriation 2065, Master Cooperative Agreement)	NA	Sikes Act, Army Regulation	2009	Ongoing	$100,000	yes	$100,000	Complete	Completed Feb 2011. Stand designation and Map poorly done. Volumes all suspect because of poorly designated stands. Contract in dispute. Holding last $10,000.
Indiana Bat Survey	Yes	CONS-14	Funds will used to survey for the endangered Indiana bat (*Myotis sodalis*). As agreed to by the USFWS and based on the extensive bat surveys done to date and absence of Indiana bat captures a CRJMTC-wide Indiana bat survey is required every five (5) years to support forest management and other activities. If Indiana bats are found, the survey frequency will be on a case by case basis per project determined in coordination with the USFWS and funding will be requested as needed.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430060008	ESA, Sikes Act, Army Regulation	2009	Ongoing	$0	yes	$49,500	In Progress	Bat survey included with larger 2009-2010 flora and fauna survey and started in 2009. Bat survey was highest priority and ready to initiate Phase 1 in FY09. $27,880 Plant Communities update (CONS-16) project + non-ENV funds also used for Indiana Bat Survey. Intended to shift funding years with other approved surveys. FY10 budget cut resulted in eliminating Plant Comm update.
							2010	Ongoing	$100,000	Partial	$40,000	Complete	$46,000 funded in FY10. $40,000 used for bat survey.
Flora and Fauna Surveys	Yes	CONS-15	plant, bird, herptile, mammal, mollusks & crayfish, Lepidoptera, and fish species to update	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430060007 OH430080004	ESA, Sikes Act, Army Regulation	2009	Ongoing	$125,000	yes	$103,338	Complete	MOA with Ohio Div of Natural Areas Funding used for plants, birds, mollusks and fish, Odonates, and herpitiles.
Plant Communities Survey	Yes	CONS-16	Funds will be used to review and update existing CRJMTC plant communities GIS data and map. An updated survey is conducted every 10 years at CRJMTS.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430060010	Sikes Act, Army Regulation	2009	Ongoing	$28,000	yes	$0	Incomplete	MOA with Ohio Department of Natural Resources This funding was used to fund part of the bat survey. Plant Comm update was eliminated because funded was needed for Indiana Bat survey.
Deer Herd Aerial Census	No	CONS-17	Funds will be used to support ODOW aerial census of Camp Ravenna deer herd.	Conservation (Appropriation 2065, Master Cooperative Agreement, Sikes Act User Fees (Appropriation 5095)	NA	Sikes Act, Army Regulation	2008	Ongoing newly listed project	$1,400	yes	$0	Complete	Done by DOW. No payment.
							2009	Ongoing	$1,500	yes	$0	Complete	Done by DOW. No payment. MOA awaiting DOW DNR signature.
							2010	Ongoing	$1,500	yes	$0	Complete	Done by DOW. No payment. MOA awaiting DOW DNR signature.
							2011	Ongoing	$1,500	yes	$0	Complete	Done by DOW. No payment requested.
							2012	Ongoing	$15,000	yes	$0	Incomplete	No survey completed due to poor snow cover.

Table 17. Implementation Projects 2008 – 2012*													Last Updated 1 November 2012
Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Pond Vegetation Management	Yes	CONS-18	Funds will be used to manage vegetation in and around pounds.	Conservation (Appropriation 2065, Master Cooperative Agreement	OH430090005	Sikes Act, Army Regulation	2008	Ongoing	$5,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$5,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$5,000	no	$0	Incomplete	Ongoing next year pending funding.
							2011	Ongoing	$6,000	no	$0	Incomplete	Ongoing next year pending funding.
							2012		$6,000	no	$0	Incomplete	Ongoing next year pending funding.
Deer Carrying Capacity Determination	Yes	CONS-19	Funds will be used to determine deer carrying capacity using Camp Ravenna plant community data, vegetation field samples, and scientific literature to develop an estimate of the deer carrying capacity per habitat type and the entire training site.	Conservation (Appropriation 2065, Master Cooperative Agreement	OH430090006	Sikes Act, Army Regulation	2009	Ongoing, newly listed project	$25,000	no	$0	Incomplete	Rescheduled each year for next year pending funding. Utilizing generally accepted carrying capacity of approx. 20 to 30 deer per square mile in interim.
Wildland Fire Management	Yes	CONS-20	Funds will be used to implement the Integrated Wildland Fire Management Plan.	Conservation (Appropriation 2065, Master Cooperative Agreement	OH430060015	Sikes Act, Army Regulation	2008	Ongoing, newly listed project	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$0	no	$0	Incomplete	This is a low priority and a lot of effort to implement. Contract or partnering efforts will be pursued if funded.
							2011	Ongoing	$0	no	$0	Incomplete	Low priority.
							2012	Ongoing	$20,000	no	$0	Incomplete	Cannot implement until Fire Plan is updated.
Wildland Fire Training and Certification	Yes	CONS-21	Funds will be used to train CRJMTC environmental staff in wildland fire management.	Conservation (Appropriation 2065, Master Cooperative Agreement	OH430060013	Sikes Act, Army Regulation	2008	Ongoing, newly listed project	$15,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$15,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$0	no	$0	Incomplete	There is really no time nor is this that great a priority to impliment. Burning with a partner agency, Fire Dept, or contracted services is more feasible.
							2011	Ongoing	$0	no	$0	Incomplete	Low priority.
							2012	Ongoing	$5,000	no	$0	Incomplete	Funded not needed until Fire Plan updated.
Stream Bank Stabilization	Yes	CONS-22	Funds will be used to stabilize and harden eroded stream banks of several streams where they exit at the training site.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090008	CWA, Sikes Act, Army Regulation	2008	Ongoing, newly listed project	$20,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$20,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2011	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2012	Ongoing	$10,000	yes	$0	Incomplete	Unable to obligate due to lack of staff. Used funds for other NR projects.
Wetland Delineation	No	CONS-23	Funds will be used to delineate wetlands in support of RTLS development projects and training missions.	Proponent Pays	Various	CWA, Sikes Act, Army Regulation	2008	Ongoing		yes	$19,867	Complete	RDP EA support via STEP procject
							2009	Ongoing		NA	$0	NA	
							2010	Ongoing	As Required	yes	$10,667	Complete	Non-ENV funds. Southern half of TTB delin. + MRF Range construction delin.
							2011	Ongoing		yes	?	Complete	South Dig Site Expansion and McKibben Connector delins as part of A&E design work. Funding unknown.
							2012	Ongoing		yes	$20,046	Complete	MRMG & CPQC delineation. STEP project OH430110002. North dig site and TVMA delin as part of A&E design contract.

Table 17. Implementation Projects 2008 – 2012* — Last Updated 1 November 2012

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Wetland Mitigation	No	CONS-24	When avoidance is not possible, funds will be used to obtain CWA Sec 404 wetland fill permits and Sec 401 clean water certifications and to design and construct wetland mitigation projects.	Proponent Pays	Various	CWA, Sikes Act, Army Regulation	2008	Ongoing		NA	$0	Complete	Partnered with BRAC restoration project to get free wetland mitigation. 5 Year monitoring paid under a separate FY07 project.
							2009	Ongoing		NA	$0	NA	
							2010	Ongoing	As Required	yes	$25,175	In Progress	MRF/Zero Range fill permit. Funded by Training.
							2011	Ongoing		NA	$0	NA	
							2012	Ongoing		yes	$47,894	In Progress	Wetland restoration for perimeter fence line clearing. STEP project OH430120002. Include 3 years of monitoring.
Conservation Staff Training	Yes	CONS-25	Funds will be used to support travel and professional training for NR management staff.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OHB64060004	Sikes Act, Army Regulation	2008	Ongoing newly listed project	$3,500	yes	?	Complete	
							2009	Ongoing	$2,000	yes	?	Complete	
							2010	Ongoing	$2,500	yes	?	Complete	
							2011	Ongoing	$5,000	no	NA	Incomplete	Not a priority in reduced budget.
							2012	Ongoing	$7,600	yes	$317	Partial	
Soil Management	Yes	CONS-26	Funds will be used to support protection and management of training site soils to include planning, erosion control, leveling, soil amendments, and re-vegetation to meet NPDES permit requirements and soils management goals of the INRMP.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090008	CWA, Sikes Act, Army Regulation	2008	Ongoing	$15,000	no	$0	Partial	Put requiremnt on contractors and do some with in-house staff.
							2009	Ongoing	$15,000	no	$0	Partial	Put requiremnt on contractors and do some with in-house staff.
							2010	Ongoing	$15,000	no	$0	Partial	Put requiremnt on contractors and do some with in-house staff.
							2011	Ongoing	$15,000	no	$0	Partial	Put requiremnt on contractors and do some with in-house staff.
							2012	Ongoing	$15,000	no	$0	Partial	house staff.
Surface Water Quality Monitoring	Yes	CONS-27	Funds will be used to implement USGS surface water quality monitoring recommendation to ensure training activity is not degrading surface water quality.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090009	CWA, Sikes Act, Army Regulation	2008	Ongoing	$15,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$15,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Discont.	$15,000	no	$0	Incomplete	STEP project disapproved
							2011	Discont.	$15,000	no	$0	Incomplete	STEP project disapproved
							2012	Discont.	$15,000	no	$0	Incomplete	STEP project disapproved
INRMP Update or Revision	Yes	CONS-28	Funds will be used for updates and major revisions to the INRMP as needed.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430060006	Sikes Act, Army Regulation	2008	Ongoing, newly listed project	$5,000	no	$0	Partial	Done in-house. GIS and mapping not done.
							2009	Ongoing	$5,000	no	$0	Partial	Done in-house. GIS and mapping not done.
							2010	Ongoing	$5,000	no	$0	Partial	Done in-house. GIS and mapping not done.
							2011	Ongoing	$5,000	no	$0	Partial	Done in-house. GIS and mapping not done.
							2012	Ongoing	$40,000	yes	$32,471	In Progress	
Salaries for Conservation Staff	Yes	CONS-29	Funds will be used to pay the salaries and benefits of OHARNG conservation staff.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OHB64060002	Sikes Act, Army Regulation	2008	Ongoing, newly listed project	$155,000	yes	?	Complete	Need more staff.
							2009	Ongoing	$160,000	yes	?	Complete	Need more staff.
							2010	Ongoing	$171,000	yes	$171,000	Complete	Need more staff.
							2011	Ongoing	$170,000	yes	$190,775	Complete	Need more staff.
							2012	Ongoing	$242,000	yes	$210,374	Complete	Contracted NR Manager hired. Part of contract in cost.

Table 17. Implementation Projects 2008 – 2012*													Last Updated 1 November 2012
Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Wetland Mitigation Monitoring	Yes	CONS-30	Funds will be used for required wetland mitigation monitoring and reporting to regulatory agency.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430080002 OH430100004		2008 2009 2010 2011 2012	Ongoing, newly listed project Ongoing Ongoing Ongoing Ongoing	As Required	NA NA NA NA NA	$0 $0 $0 $0 $0	Complete Complete Complete Complete NA	Monitoring for Camp Perry and Ravenna Rt 80 mitigation sites funded for 5 year period with FY07 funds. CP - $21,000. Rt 80 - $31,000. Rt 80 site. Approx. $6,000 FY7 funds. Rt 80 site. Approx. $6,000 FY07 funds. Rt 80 site. Approx. $6,000 FY07 funds. No monitoring during this 5-FY period. MKF Range and MPMG Range mitigation monitoring coming in next couple years.
Update CRJMTC Soldier's Environmental Handbook	No	ITAM-1	[illegible] copies of the existing environmental information booklet given out to soldiers who train at the RTLS so that it is current, accurate, and useful in helping the OHARNG maintain sustainable training land.	ITAM (Appropriation 2065, Master Cooperative Agreement)	NA	Sikes Act, Army Regulation	2008	Ongoing	$2,000	yes	$0	Complete	Updated in-house. Contracted printing.
Vegetation Management	No	SRM-1	Funds will be used to contract the herbicide applications portion of vegetation control activities at the RTLS.	SRM (Appropriation 2065, Master Cooperative Agreement)	NA	Sikes Act, Army Regulation, FIFRA	2008 2009 2010 2011 2012	Ongoing Ongoing Ongoing Ongoing Ongoing	$65,000 $70,000 $95,000 $100,000 $100,000	no no yes yes no	$0 $0 $94,732 $137,127 $0	Incomplete Incomplete Complete In Progress In Progress	Not funded by facilities. Some in-house work done. Not funded by facilities. Some in-house work done. Non_ENV funds. Some work done in FY10. Balance to be done in FY11. Some in-house work done. Non-ENV funds. Continued control with FY11 funding.
*Anticipated projects needed to implement INRMP programs from FY08 through FY12.													

January 11, 2013

Mr. Tim Morgan
Ohio Army National Guard
Camp Ravenna Joint Military Training Center
Environmental Office
1438 State Route 534 SW
Newton Falls, Ohio 44444

Subject: Camp Ravenna Joint Military Training Center Integrated Natural Resource Management Plan Review for Operation and Effect Meeting Minutes

Dear Mr. Morgan:

The following are the minutes of the meeting held at the Camp Ravenna Joint Military Training Center (Camp Ravenna) Environmental Office at 1438 State Road 534 SW, Newton Falls, Ohio 44444 on December 19th 2012 to review the 2008 Camp Ravenna Integrated Natural Resource Management Plan (INRMP) for operation and effect.

Meeting attendees (attendance sheet attached):

Participant	Affiliation	Phone Number	Email
LTC Ed Meade	CRJMTC- CDR	(614) 336-6560	William.e.meade.mil@mail.mil
Major Richard B. Saphore	CRJMTC- Logistics	(614) 336-6790	Richard.b.saphore@.mil@mail.mil
SGM Doug Garloch	CRJMTC-ENG	(614) 336-6795	Douglas.garloch@ us.army.mil
Tanner Dunlap	CRJMTC- ENG	(614) 336-6567	Tanner.dunlap@us.army.mil
Mike Yates	CRJMTC- Range Ops	(614) 336-6193	Michael.m.yates2.mil@mail.mil
Tim Morgan	CRJMTC- ENV	(614) 336-6568	Timothy.m.morgan.nfg@mail.mil
Brian Riley	CRJMTC- ENV	(614) 336-6568	Brian.p.riley17.ctr@mail.mil
David Henry	USFWS- Region 3	(614) 416-8993	David.henry@fws.gov
John Kessler	Ohio DNR	(614) 265-6621	John.kessler@dnr.state.oh.us
Allen Lea	Ohio Division of Wildlife	(330) 245-3023	Allen.lea@dnr.state.oh.us
Scott Peters	Ohio Division of Wildlife	(330) 644-2293	Scott.peters@dnr.state.oh.us
Jamie Willaman	EnviroScience Inc.	(330) 688-0111	jwillaman@enviroscienceinc.com

Meeting start time approximately 1030 EST.

INTRODUCTION

- Tim Morgan- Overview of the program being implemented to transform ammunition plant to training facility
  - Overview of staff.
  - Overview of INRMP review according to Sikes Act
    - Annual reviews
    - 5 year reviews

- LTC Meade- Mission overview: satisfy training need with environmental compliance
  - Camp Ravenna staff introductions

- General introductions of attendees

PRESENTATION

- Tim Morgan- (Power Point presentation attached)
  - Ravenna Training and Logistics Site (RTLS) is now Camp Ravenna Joint Military Training Center (CRJMTC)
  - Functional review overview
  - Camp Ravenna facility overview

PRESENTATION (continued)

- Michael Yates- Types of training offered at Camp Ravenna
  - Individual soldier task training
  - Individual movement technique training
  - Specialized to need training of engineers
  - Individual weapons qualifications
  - Live demolitions
  - Homeland Force training (FEMA)
  - More training moving to and being developed for Camp Ravenna
  - Future development of maneuvers and heavy maneuvers areas

- Tim Morgan- More training explanation
  - Changes from 2008- Range development
  - NEPA document for range development
  - INRMP supports development
  - Future development- more ranges
  - Wetland challenge in development
  - Sewer and water development to main gate site

- Tim Morgan- Natural Resource Management Overview
  - Planning Level Surveys (PLS)
    - Water Resources
    - Topography and Soil mainly unchanging
    - Wetlands- As needed; 5 year jurisdictional determinations
    - Flora- 10 year survey cycle
    - Fauna
      - Annual bird surveys
      - Remaining fauna- 5 year survey cycle
    - Vegetative Communities- 10 year survey cycle
    - Threatened and Endangered Species
  - Sustainable Land Use
  - Forest Management
    - Timbering no more than 50% of compartment in 10 years
    - Brush cutting grasslands, not controlled burn
    - No burn boss on Camp Ravenna staff, Camp Ravenna needs to coordinate with Nature Conservancy
  - Wildlife Management
    - MOA with DOW at DNR Department Level
      - Funding of aerial hunt survey
    - Public fees funding
    - Nuisance wildlife management
  - Wetland Management
    - Use restrictions
    - Wetland mitigations sites
    - Stream mitigations sites
  - Habitat management
    - Young forest initiative
    - Woodcock initiative

- Tim Morgan- 2008-2012 Implementation
  - Table 17 Handout (Attached) Implementation and Funding
    - What was funded 2008-2012, why or why not
  - Table B-1 Handout (Attached) Degree of INRMP Implementation
    - 12 goals of INRMP, how they tie to Camp Ravenna projects

PRESENTATION (continued)

- Question. Missing Items?
  - Attendees agreed there were none
- Goals are broad to keep INRMP adaptively manageable and flexible
  - Attendees agreed that was the best approach

DISCUSSION

- Indiana Bat
  - Tim Morgan- Camp Ravenna's ability to do basewide Indiana Bat surveys every 5 years is critical to the success of the mission, versus having to do a survey for each initiated project. This plan was established previously with Angela Boyer and Camp Ravenna would like to proceed with the current procedure
  - David Henry- The 2007 Indiana Bat survey protocol is changing to an acoustic survey protocol in 2013
  - Tim Morgan- Question. If the survey protocol changes are the 2010 survey conducted under the existing protocol negated or will the schedule for the next survey to be conducted in 2015 be sufficient?
  - David Henry- The new protocol will not negate the results of the 2010 survey.
  - General White Nose Syndrome (WNS) discussion
  - Tim Morgan- Camp Ravenna will continue the current management strategy of surveys at 5 year intervals and will state in the INRMP that the most current USFWS survey protocol will be utilized.
  - David Henry- This will be sufficient for USFWS compliance
  - Michael Yates- Question. If an Indiana Bat is captured on the facility what does it affect?
  - David Henry- Camp Ravenna will have to use Protection and Enhancement Plan (PEP) to see what affects can be utilized to minimize take.
  - Tim Morgan- An Indiana Bat capture would necessitate USFWS coordination for each project and limit the development season
  - Michael Yates- Question. So because there are no recorded Indiana Bats within the facility, we are not restricted to seasonal cutting restrictions?
  - David Henry- Yes.

- State Endangered Species
  - Tim Morgan- Question. How do state laws regarding listed species affect Camp Ravenna? If Camp Ravenna has state listed species on-site, how does state law apply to development?
  - John Kessler- The state has authority to enact federal protection laws if damaging take occurs, but generally the state provides minimization and avoidance suggestions.
  - Brian Riley- Question. May we get something to that effect in writing?
  - Scott Peters- The Law Writer website has the details of the Ohio Administrative Code.
  - David Henry- The Endangered Species Act allows the USFWS to protect both the listed species and their habitat. The state only has laws governing the take of listed species not their habitat.
  - Tim Morgan- When the state comments on a project in wetland permitting regarding Indiana Bat it makes the approval process difficult, because Camp Ravenna has an MOA with USFWS.
  - John Kessler- When that happens call the ODNR and we will resolve the situation.
  - David Henry- The USFWS is working on guidance to correct this situation.

- Additional Questions/Discussion
  - David Henry- Additional bat species may soon be federally listed, an in-house assessment of Little Brown Bats and Northern Long-ear Bats is being conducted.

DISCUSSION (continued)

- Brian Riley- Question. What about the Bald Eagle listing of Species of Concern?
- David Henry- The Bald Eagle has its own guidance now, separate from the ESA, it has been remove from the list. The USFWS can issue take permits for projects within 660 feet of a known nest. There is a new Bald Eagle Coordinator in Lansing, Michigan. David will send his contact information to Tim Morgan and Brian Riley.
- Brian Riley- Question. How often are the endangered species lists revised by the USFWS?
- David Henry- Varies according to developments of species and in-house assessments.

CONCLUSION

- Tim Morgan- Question. Is the INRMP working? Do we all feel that an update is all that is required, versus an INRMP revision?

- All Attendees- Yes.

- Tim Morgan- Once the update draft is ready we will transmit digital copies to everyone for review. Once all comments are incorporated I final draft will be sent along with a request for a concurrence letter from each agency. A template of a concurrence letter will accompany the draft.

- Tim Morgan- The major revision will be to figures and mapping and incorporating the results of flora/fauna surveys.

- Tim Morgan- Questions?

Meeting end time approximately 1230 EST.

Should you have any questions, or if this summary does not match your recollections, please feel free to contact me at (412) 310-2614.

Thank you,

Jamie Willaman

Jamie Willaman
Senior Project Administrator

Enclosure

cc: Attendees

Camp Ravenna Joint Military Training Center
Integrated Natural Resource Management Plan (INRMP)
Review for Operation and Effect Meeting
Camp Ravenna Environmental Office
1438 State Route 534 SW, Newton Falls, OH 44444
December 19, 2012

Participant Name	Affiliation	Phone Number	Email
Brian Riley	CRJMTC-ENV	614-336-6568	brian.p.riley3.ctr@army.mil
Jamie Willaman	EnviroScience	330-688-0111	jwillaman@enviroscienceinc.com
David Henry	USFWS	614-416-8993 X27	david_henry@fws.gov
TANNER DUNLAP	CRJMTC-ENG	614-336-6567	tanner.dunlap@us.army.mil
John Kessler	Ohio DNR	614-265-6621	john.kessler@dnr.state.oh.us
Scott Peters	Ohio Division of Wildlife	330-644-2293	scott.peters@dnr.state.oh.us
ALLEN LEA	O.D.O.W.	330-245-3023	ALLEN.LEA@DNR.STATE.OH.US
Mike Yates	CRJMTC-Range ORS	614 336 6193	michael.m.yates2.mil@mail.mil
MAJOR RICHARD B. SAPHORE	CRJMTC-LOGISTICS	(614) 336-6790	richard.b.saphore@.mil@mail.mil
SGM DOUG GARLOCH	CRJMTC-ENG	(614) 336-6795	douglas.garloch@us.army.mil
LTC Ed Meade	CRJMTC-CDR	614-336-6560	William.e.meade.mil@mail.mil
Tim Morgan	CRJMTC-ENV	614-336-6568	timothy.m.morgan.nfg@mail.mil

Camp Ravenna Joint Military Training Center (CRJMTC)

INRMP

Review for Operation and Effect

Timothy M. Morgan C.F.

19 December 2012

A-45

Agenda

- Welcome and Introductions
- Overview of INRMP Functional Review Requirements
- Camp Ravenna Overview
- Natural Resources Overview & Current Year Implementation
- 2008-2012 Implementation Review
- INRMP Review for Operation and Effect
- Open Discussion
- Is the INRMP Working?
- Recommendation

FUNCTIONAL REVIEWS

- Plans should be reviewed to ensure effectiveness
- Avoid dust collectors

- Review previous year accomplishments
- Updates to task schedule
- Conducted in house, then results documented and staffed to agencies
- Outcome: schedule update; memo to agencies
- No new NEPA

- Review entire document
- Identify all changes needed
- Conducted jointly with agencies
- Outcome: Decision to revise or to continue existing INRMP
- May require new REC/Check at minimu

- Partner agencies involved; USFWS and State Fish and Game

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Defining Review for Operation and Effect (ROE)

- National Guard Bureau INRMP Guidance dated 9 April 2012 (handout)
- Dept of the Army Memorandum dated 25 May 2006 (handout)
- Must be conducted at least every 5 years
- Joint effort between USFWS and State Fish and Game Agency
- Assess current state of plan
  - Is it meeting the requirements of the Sikes Act?
  - Is it contributing to the conservation and rehabilitation of natural resources?
  - Is it helping the installation commander manage natural resources so as to ensure that installation lands remain available and in good condition to support the installation's military mission (i.e., ensure no net loss in the capability of military installation lands to support the military mission of the installation)?
- Update language in executive summary and purpose and need
- Document coordination with agencies relating to reviews and decision criteria for determining need to conduct a revision vs. an update.

ACTIONS REQUIRED BY REVIEWS

Annual	5-Year ROE	Action
	x	Determine that INRMP is still working
x	x	Ensure metrics tracker/AEDB-EQ has current data
x	x	Must Fund Projects are Budgeted
	x	Review workforce training/staffing
	x	Comprehensive review of installation mission and INRMP goals and objectives
x		Annual work plan revision
	x	Review planning level surveys
	x	USFWS RO and State Fish and Game formal participation and Concurrence
x		USFWS FO and State Fish and Game receive outcome memorandum from state

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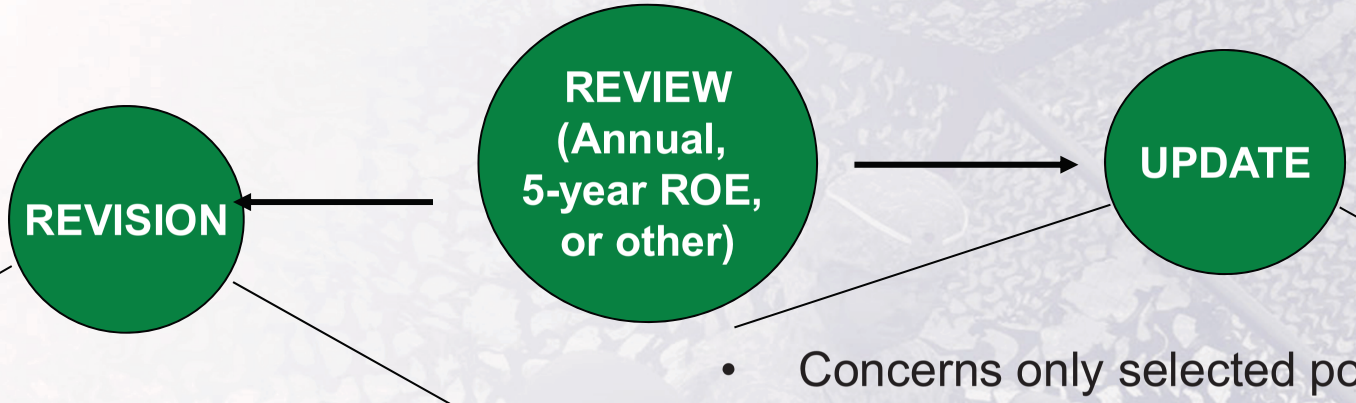
REVISION VS. UPDATE



- Changes to goals, objectives, management, legal, or regulatory changes that result in "materially significant different biophysical consequences"
- It is determined necessary by the state, Fish and Wildlife, and NGB
- Complete document revision
- Usually new EA

- Concerns only selected portions of an existing INRMP
  - do not result in changes to goals or objectives
  - do not result in "materially different biophysical consequences"
- Most common update is revised project list/schedule
- New surveys, new INRMP organization
- REC or sometimes no new NEPA

A-50

WHAT'S THAT TERM?

- Biophysical Consequences is interpreted to follow that the definition of ecosystem integrity:
  - The cumulative physical and biological environment of plants, animals, land, water, and air, and natural processes and functions.
  - Integrity is the measure to which the natural environment contains components that are indigenous to the area, and to which naturally occurring processes, functions, and cycles are occurring.
- Materially significant differences are measurable changes the ecosystem and ecosystem integrity that cannot be mitigated through available resources or measures outlined in the original INRMP. This can include individual or cumulative affects from projects, policies and procedures, or land management/use decisions.A

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Camp Ravenna Overview

Mission and Training Requirements
Mission/Training Changes Since 2008 INRMP
Future Development

Military Staff

Natural Resources Overview and Current Year Implementation

Natural Resources Management

Integrated Natural Resources Management Plan

- 5 Year Plan – legal requirement
- All Natural Resources
- US Fish and Wildlife Service
- Ohio Department of Natural Resources
- Integrated with Trainers
- Integrated Training Area Management (ITAM)
- National Environmental Policy Act (NEPA)

Natural Resources Planning Level Surveys

- Topography
- Soils
- Water Resources
- Wetlands
- Flora
- Vegetation Communities
- Fauna
- Threatened and Endangered Species

A-55

Natural Resources

- Water resources
  - Streams (200+ miles)
    - South Fork Eagle Creek, State Resource Water
    - Sand Creek, State Resource Water
    - Hinkley Creek
  - Ponds (over 50 ponds)
    - most beaver built
    - others are dug or old settling ponds
  - Wetlands
    - 1/4 of property meets regulatory definition as a wetland
    - wet fields and forested wetlands

A-56

Natural Resources (continued)

- Vegetation
  - General
    - Beech-Maple is major forest type
    - 817 plant species
    - 25 % of these are non-native
  - Communities
    - 18 different plant communities
  - Unique Plant Communities
    - Hemlock-White Pine Hardwood Forest
    - 5 Special Management Areas (2,555 acres)

A-57

Natural Resources (continued)

- Wildlife
  - Diversity of Species
    - 42 Mammals
    - 214 Birds
    - 34 Amphibians and Reptiles
    - 46 Fish (plus 2 hybrids)
    - 2 aquatic & 2 terrestrial Crayfish
    - 7 Unionid molluscs / 10 Sphaeriid molluscs
    - 12 aquatic Snails / 45 terrestrial Snails
    - 800+ Beetles
    - 64 Odonates (dragonflies and damselflies)
    - 64 Butterflies (2 subspecies)
    - 793 Moths

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Natural Resources (continued)

- Rare Species
  - No Federally Endangered or Threatened Species
  - State Endangered
    - Bobcat, *Felis rufus*
    - American Bittern, *Botaurus lentiginosus* (migrant)
    - Northern Harrier, *Circus cyaneus* (migrant)
    - Sandhill Crane, *Grus Canadensis*
    - Yellow-bellied Sapsucker, *Sphyrapicus varius*
    - Golden-winged Warbler, *Vermivora chrysoptera*
    - Osprey, *Pandion haliaetus* (migrant)
    - Trumpeter Swan, *Cygnus buccinator* (migrant)
    - Mountain Brook Lamprey, *Ichthyomyzon greeleyi*
    - Graceful Underwing, *Catocala gracilis*
    - Tufted Moisture-loving Moss, *Philonotis fontana* var. *caespitosa*
    - Narrow-necked Pohl's Moss, *Pohlia elongata var. elongata*

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Natural Resources (continued)

- State Threatened
  - Barn Owl, *Tyto alba*
  - Dark-eyed Junco, *Junco hyemalis* (migrant)
  - Hermit Thrush, *Catharus guttatus* (migrant)
  - Least Bittern, *Ixobrychus exilis*
  - Least Flycatcher, *Empidonax minimus*
  - *Psilotreta indecisa* (caddisfly)
  - Pale sedge, *Carex pallescens*
  - Simple Willow-herb, *Epilobium strictum*
  - Woodland Horsetail, *Equisetum sylvaticum*
  - Lurking leskea, *Plagiothecium latebricola*
- State Potentially Threatened Plants – 12 species
- State Species of Concern – 21 species
- State Special Interest – 21 species

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Natural Resources Management Activities

- Sustainable Land Use
  - Training Site Development
  - Training Area Use Capability
  - Compliance
  - Resource Inventorying and Monitoring
- Forest Management
  - Forest Ecosystem Management
  - Timber Harvests
  - Firewood Sales
  - Timber Stand Improvement
- Wildlife Management
  - Hunting, Fishing, Trapping
- Invasive Species Management
  - Phragmites, Purple loosestrife, Multiflora rose

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Natural Resources Management Activities (Continued)

- Habitat Management
  - Wetlands
  - Grasslands
- Recreation / Public Outreach
  - Hunting
  - Fishing
  - Adopt-A-School
  - Boy Scouts
  - Bird and Nature Walks
  - Bike Rides
- Education / Research
  - Interns
  - Training Site Tours
  - Academic Research
  - US Forest Service

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Current Year INRMP Implementation

- Forest Management
  - Timber harvest – up to 300,000 board feet, $100,000
  - Timber Stand Improvement – 350 acres, $27,195
  - Continue firewood sales
  - Archeological survey of timber harvest areas – 250 acres, $29,380
- Wildlife Management
  - Continue all programs
  - Coordinate deer hunts with DOW after aerial deer count
  - $12,000 for nuisance management
- Invasive Species Management
  - Ailanthus and Japanese Knotweed control
  - Complete roadside survey
  - Scope out additional needs - $32,300

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Current Year INRMP Implementation continued

- Wetland Management
  - Fill permits for MRF & MPMG Ranges
  - Avoid fills on Fire and Maneuver Range and CPQC
  - Pursue funding for FY14/15 mitigation
- Habitat Management
  - Delay mowing where possible
  - $42,000 for habitat projects
- Update Wildland Fire Management Plan - $15,000
- Stream Bank Stabilization - $30,000

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2008-2012 Implementation Review

2008-2012 Implementation Review

- Table 17 Implementation Projects
- Table B-1 Degree of Previous INRMP Implementation
- Forest Management
  - Timber harvest – 857,000 bd. ft, 455 ac, $285,801
  - Minor Forest Products Sales
    - Fence Salvage – 94,700 bd. ft, $18,000
    - Buckeye Village Salvage – 15,700 bd. ft., $4,000
    - Grp 2 Dig Site & Power Line Salvage – 8,000 bd. Ft., $1,200
    - Firewood Permits – 483.5 cords, $4,835
- Hunting/Fishing/Trapping
  - Deer Hunters ~ 7,100
  - Small Game / Turkey Hunters ~ 250
  - Fishermen ~ 300
  - Trappers ~ 40
  - Fee Collection - $26,634+

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INRMP Review for Operation and Effect

Review Metrics

Annual	5-Year ROE	Action
x	x	Ensure metrics tracker/AEDB-EQ has current data (**Submitted Sep 2012**)
x	x	Must Fund Projects are Budgeted (**Funding requested for all projects**)
	x	Review workforce training/staffing (**New NR Manager 2012**)
	x	Comprehensive review of installation mission (**Presented by Staff**)
	x	INRMP goals and objectives are still valid (**Appendix B Analysis**)
	x	No net loss in the capability of installation lands to support the military mission (**Training Site Staff**)
x		Annual work plan revision (**To be finalized after deer survey**)
	x	Review planning level surveys (**Submitted to Agencies 2010**)
	x	Determine that INRMP is still working (**Later Slide**)
	x	USFWS RO and State Fish and Game formal participation and Concurrence (**Intend to ask for signed letters from USFWS and DNR/DOW**)

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Open Discussion

- Indiana Bat Management
- State Endangered Species Laws
- Other Issues

A-69

Is The INRMP Working?

- Table 17 and Table B-1
- Is it meeting the requirements of the Sikes Act?
- Is it contributing to the conservation and rehabilitation of natural resources?
- Is it helping the installation commander manage natural resources so as to ensure that installation lands remain available and in good condition to support the military mission (i.e., ensure no net loss in the capability of installation lands to support the military mission)?
- Areas that need improvement

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Recommendation

- Update and Continue Implementation of Current INRMP - Recommended

- Current INRMP Requires Major Revision – Not Recommended

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Ohio National Guard

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"When Called, We Respond with Ready Units"

Table 17. Implementation Projects 2008 – 2012*													Last Updated 1 November 2012
Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Annual Breeding Bird Survey	NO	CONS-1	Funds will be used to conduct an annual breeding bird survey on established breeding bird routes. The survey will identify nesting birds at the RTLS in accordance with established national breeding bird survey protocols and identify significant upward or downward trends in the breeding bird population.	Forestry Reimbursable	NA	ESA, Sikes Act, Army Regulation	2008	Ongoing	$2,500	yes	$2,200.00	Complete	
							2009	Ongoing	$2,500	yes	$2,237.40	Complete	
							2010	Ongoing	$2,500	yes	$0.00	Complete	Included with basewide bird survey OH DNR
							2011	Ongoing	$2,500	No	$0.00	Complete	Modified continuation of 2010 bird survey (volunteer)
							2012	Ongoing	$2,500	yes	$2,456.00	Complete	
Forest Management	NO	CONS -2	Funds will be used for forestry related supplies and equipment and timber stand improvement.	Forestry Reimbursable	NA	Sikes Act, Army Regulation	2008	Ongoing	$15,300	yes	$15,169.08	Complete	249 acres
							2009	Ongoing	$15,300	yes	$14,457.22	Complete	226 acres
							2010	Ongoing	$15,400	yes	$28,274.36	Complete	421 acres
							2011	Ongoing	$15,400	yes	$12,250.00	Complete	175 acres
							2012	Ongoing	$15,500	yes	$22,200.00	In Progress	300 acres
Forestry Archeology Surveys	NO	CONS-3	Funds will be used for archeological surveys in support of timber harvest activities during the planning period FY07 through FY 2011.	Forestry Reimbursable	NA	NHPA of 1966, Sikes Act, Army Regulation	2008	Ongoing	$55,000	yes	$31,015.65	Complete	576 acres
							2009	Ongoing	$55,000	yes	$28,100.00	Complete	388 acres
							2010	Ongoing	$55,000	yes	$31,709.36	Complete	560 acres
							2011	Ongoing	$55,000	yes	$30,243.00	Complete	388 acres
							2012	Ongoing	$55,000	yes	$33,602.00	In Progress	Contract award under dispute. Acres unknown.
Hunting, Fishing, and Trapping Administration	NO	CONS-4	Funds will be used cover administrative costs associated with hunting, fishing, and trapping programs.	Sikes Act User Fees (Appropriation 5095)	NA	Sikes Act, Army Regulation	2008	Ongoing	$600	yes	$0	Complete	User fee funding not used.
							2009	Ongoing	$700	yes	$0	Complete	User fee funding not used.
							2010	Ongoing	$700	yes	$0	Complete	User fee funding not used.
							2011	Ongoing	$700	yes	$0	Complete	User fee funding not used.
							2012	Ongoing	$800	yes	$0	Complete	User fee funding not used.
Deer Hunt Area Management	Yes	CONS-5	Funds will be used for supplies and labor to maintain hunt area boundary markings, hunt signs, and to mow and maintain access lanes in hunt areas.	Conservation (Appropriation 2065, Master Cooperative Agreement, Sikes Act User Fees (Appropriation 5095)	OH430090004	Sikes Act, Army Regulation	2008	Ongoing	$10,000	no	$0.00	Partial	Volunteer labor and partial execution
							2009	Ongoing	$10,000	no	$0.00	Partial	Volunteer labor and partial execution
							2010	Ongoing	$10,000	yes	$10,000.00	Complete	Volunteer labor + funded in FY10 end of year and some mowing done in conjunction with grassland habitat mowing.
							2011	Ongoing	$10,000	no	$0.00	Partial	Volunteer labor and partial execution
							2012	Ongoing	$10,000	yes	$0.00	Partial	All STEP funding used for grassland management. Volunteer labor used for hunt area management.
Grassland Management	Yes	CONS-6	Funds will be used to support conversion of non-native grasslands to native grasses and annual management such as mowing and spot treatment with herbicides as necessary remove woody encroachment. Mowing will be done in areas were burning is not possible. Up to 100 acres will be done per year as funds permit.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090004	Sikes Act, Army Regulation, Migratory Bird Treaty Act, N.American Waterfowl Mgmt. Plan	2008	Ongoing	$20,000	yes	$20,000.00	Complete	$20,000 FY07 DOD Reserve Acct. Project, 12 acres. STEP project not funded in FY08.
							2009	Ongoing	$20,000	no	$0.00	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$20,000	yes	$23,900.00	Complete	STEP Projeect funded end of year UFR. 152 acres mowed/brush cut. Total cost $33,900.
							2011	Ongoing	$20,000	no	$0.00	Incomplete	Ongoing next year pending funding.
							2012	Ongoing	$20,000	yes	$97,083.50	In Progress	Grassland and Young Forest Habitat management.
Pond Maintenance and Repair	Yes	CONS -7	Funds will be used for the maintenance of access routes, water control structures, dikes, and dams on ponds and wetland areas.	Conservation (Appropriation 2065, Master Cooperative Agreement, Sikes Act User Fees (Appropriation 5095)	OH430090005	CWA, Sikes Act, Army Regulation	2008	Ongoing	$20,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$20,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2011	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2012	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.

Table 17. Implementation Projects 2008 – 2012* Last Updated 1 November 2012

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
							2008	Ongoing	$10,000	no	$0	Partial	Partial implementation via beaver trapping and in house staff
	Yes		Funds will used to keep the three main streams (Hinkley Creek, South Fork Eagle Creek, and Sand Creek) free from beaver dams so as not to degrade current high quality of stream habitats. Beaver will be trapped during trapping season and dams mechanically removed as necessary. Beaver and floodings in side channels will also be removed only if damaging government facilities and impeding mission capability. Other nuisance wildlife will be controlled as necessary.	Conservation (Appropriation 2065, Master Cooperative Agreement)			2009	Ongoing	$10,000	no	$0	Partial	Partial implementation via beaver trapping and in house staff
							2010	Ongoing	$10,000	no	$0	Partial	Partial implementation via beaver trapping and in house staff
							2011	Ongoing	$10,000	no	$0	Partial	Partial implementation via beaver trapping and in house staff
Nuisance Wildlife Management		CONS -8			OH430090007	CWA, Sikes Act, Army Regulation	2012	Ongoing	$10,000	yes	$10,000	Partial	Unable to execute funds due to lack of staff. Funds used for grassland habitat management. Partial implementation via beaver trapping and in house staff.
				Conservation (Appropriation 2065, Master Cooperative Agreement)	OH000060013		2008	Ongoing	$36,500	no	$0	Partial	INRMP update some data, DIMR-GIMS
	Yes				OH430060005		2009	Ongoing	$20,000	no	$0	Partial	Some DIMR-GIMS support OH430060005 ($10,000) for data creation disapproved for FY10. New aerial photos OH000060013 centrally funded by NGB ($25,000). OH430060017 ($1,500) for GIS equipment and OH430090002 ($15,000) for part time GIS employee not funded.
					OH430060017		2010	Ongoing	$36,500	no	$0	Partial	
							2011	Ongoing	$20,000	no	$0	Partial	Some DIMR-GIMS support
Natural Resources GIS Support		CONS -9	Funds will be used to link deer hunt data, breeding bird data, and other NR data to GIS, to produce maps, and to acquire equipment, data and aerial photos.		OH430090002	Sikes Act, Army Regulation	2012	Ongoing	$36,500	yes	$15,000	Partial	Unable to execute STEP funds due to lack of staff. Some DIMR-GIMS support.
				Conservation (Appropriation 2065, Master Cooperative Agreement)			2008	Ongoing newly listed project	$12,000	yes	$4,295.52	Partial	1 month of service
	Yes						2009	Ongoing	$12,000	yes	$0	Incomplete	Unable to execute. Ongoing next year.
							2010	Ongoing	$12,000	yes	$0	Incomplete	Unable to execute. Ongoing next year.
							2011	Ongoing	$27,000	yes	$0	Incomplete	Low priority in reduced budget.
Seasonal NR Employee		CONS-10	Funds will be used to hire a seasonal natural resources employee.		OH430060001	Sikes Act, Army Regulation	2012	Ongoing	$28,000	yes	$100,012.68	Complete	Full-time contracted NR Manager
				Conservation (Appropriation 2065, Master Cooperative Agreement)			2008	New	$0	no	$0	Complete	NGB National Contract with USFS. Plan completed in 2009.
	Yes						2009	Ongoing	$0	no	$0	Incomplete	2009 Plan lacks burn schedule and estimated costs. 2010 funds requested to update plan. Not funded.
							2010	Ongoing	$15,000	no	$0		Not funded.
							2011	Ongoing	$15,000	no	$0		Not funded.
Integrated Wildland Fire Management Plan		CONS -11	Funds will be used to develop and update an Integrated Wildland Fire Management Plan.		OH430060012	Sikes Act, Army Policy	2012	Ongoing	$0	no	$0		No funds requested due to lack of staff to implemt. $15,000 approved for FY13.

Table 17. Implementation Projects 2008 – 2012*													Last Updated 1 November 2012
Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Invasive/ Noxious Weed Management	Yes	CONS-12	Funds will be used to control purple loosestrife, multiflora rose, Russian olive, autumn olive, and other invasive / noxious weeds identified throughout the INRMP implementation period.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090005	Sikes Act, Army Regulation, OAC 901:5-37-01, *Prohibited noxious weeds*	2008	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$12,000	no	$0	Partial	Inhouse Phragmites control at Rt 80 wetland mitigation site and Japanese knotweed on Wadsworth Rd.
							2010		$12,000	no	$0	Partial	Inhouse as time and material permit.
							2011	Ongoing	$12,000	no	$0	Partial	Inhouse Phragmites control at Rt 80 wetland mitigation site and Japanese knotweed on Wadsworth Rd.
							2012		$22,000	yes	$41,447.00	In Progress	Allanthus, Japnese Knotweed control and invasive species road survey.
Forest Inventory	No	CONS-13	Funds will be used to obtain a GIS compatible forest inventory of CRJMTC. The work will include revising the existing GIS Forest Management map and linking the new forest inventory data to the map.	Forestry Reimbursable, Conservation (Appropriation 2065, Master Cooperative Agreement)	NA	Sikes Act, Army Regulation	2009	Ongoing	$100,000	yes	$100,000	Complete	Completed Feb 2011. Stand designation and Map poorly done. Volumes all suspect because of poorly designated stands. Contract in dispute. Holding last $10,000.
Indiana Bat Survey	Yes	CONS-14	Funds will used to survey for the endangered Indiana bat (*Myotis sodalis*). As agreed to by the USFWS and based on the extensive bat surveys done to date and absence of Indiana bat captures a CRJMTC-wide Indiana bat survey is required every five (5) years to support forest management and other activities. If Indiana bats are found, the survey frequency will be on a case by case basis per project determined in coordination with the USFWS and funding will be requested as needed.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430060008	ESA, Sikes Act, Army Regulation	2009	Ongoing	$0	yes	$49,500	In Progress	Bat survey included with larger 2009-2010 flora and fauna survey and started in 2009. Bat survey was highest priority and ready to initiate Phase 1 in FY09. $27,880 Plant Communities update (CONS-16) project + non-ENV funds also used for Indiana Bat Survey. Intended to shift funding years with other approved surveys. FY10 budget cut resulted in eliminating Plant Comm update.
							2010	Ongoing	$100,000	Partial	$40,000	Complete	$46,000 funded in FY10. $40,000 used for bat survey.
Flora and Fauna Surveys	Yes	CONS-15	plant, bird, herptile, mammal, mollusks & crayfish, Lepidoptera, and fish species to update	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430060007 OH430080004	ESA, Sikes Act, Army Regulation	2009	Ongoing	$125,000	yes	$103,338	Complete	MOA with Ohio Div of Natural Areas Funding used for plants, birds, mollusks and fish, Odonates, and herpitiles.
Plant Communities Survey	Yes	CONS-16	Funds will be used to review and update existing CRJMTC plant communities GIS data and map. An updated survey is conducted every 10 years at CRJMTS.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430060010	Sikes Act, Army Regulation	2009	Ongoing	$28,000	yes	$0	Incomplete	MOA with Ohio Department of Natural Resources This funding was used to fund part of the bat survey. Plant Comm update was eliminated because funded was needed for Indiana Bat survey.
Deer Herd Aerial Census	No	CONS-17	Funds will be used to support ODOW aerial census of Camp Ravenna deer herd.	Conservation (Appropriation 2065, Master Cooperative Agreement, Sikes Act User Fees (Appropriation 5095)	NA	Sikes Act, Army Regulation	2008	Ongoing newly listed project	$1,400	yes	$0	Complete	Done by DOW. No payment.
							2009	Ongoing	$1,500	yes	$0	Complete	Done by DOW. No payment. MOA awaiting DOW DNR signature.
							2010	Ongoing	$1,500	yes	$0	Complete	Done by DOW. No payment. MOA awaiting DOW DNR signature.
							2011	Ongoing	$1,500	yes	$0	Complete	Done by DOW. No payment requested.
							2012	Ongoing	$15,000	yes	$0	Incomplete	No survey completed due to poor snow cover.

Table 17. Implementation Projects 2008 – 2012*													Last Updated 1 November 2012
Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Pond Vegetation Management	Yes	CONS-18	Funds will be used to manage vegetation in and around pounds.	Conservation (Appropriation 2065, Master Cooperative Agreement	OH430090005	Sikes Act, Army Regulation	2008	Ongoing	$5,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$5,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$5,000	no	$0	Incomplete	Ongoing next year pending funding.
							2011	Ongoing	$6,000	no	$0	Incomplete	Ongoing next year pending funding.
							2012		$6,000	no	$0	Incomplete	Ongoing next year pending funding.
Deer Carrying Capacity Determination	Yes	CONS-19	Funds will be used to determine deer carrying capacity using Camp Ravenna plant community data, vegetation field samples, and scientific literature to develop an estimate of the deer carrying capacity per habitat type and the entire training site.	Conservation (Appropriation 2065, Master Cooperative Agreement	OH430090006	Sikes Act, Army Regulation	2009	Ongoing, newly listed project	$25,000	no	$0	Incomplete	Rescheduled each year for next year pending funding. Utilizing generally accepted carrying capacity of approx. 20 to 30 deer per square mile in interim.
Wildland Fire Management	Yes	CONS-20	Funds will be used to implement the Integrated Wildland Fire Management Plan.	Conservation (Appropriation 2065, Master Cooperative Agreement	OH430060015	Sikes Act, Army Regulation	2008	Ongoing, newly listed project	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$0	no	$0	Incomplete	This is a low priority and a lot of effort to implement. Contract or partnering efforts will be pursued if funded.
							2011	Ongoing	$0	no	$0	Incomplete	Low priority.
							2012	Ongoing	$20,000	no	$0	Incomplete	Cannot implement until Fire Plan is updated.
Wildland Fire Training and Certification	Yes	CONS-21	Funds will be used to train CRJMTC environmental staff in wildland fire management.	Conservation (Appropriation 2065, Master Cooperative Agreement	OH430060013	Sikes Act, Army Regulation	2008	Ongoing, newly listed project	$15,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$15,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$0	no	$0	Incomplete	There is really no time nor is this that great a priority to impliment. Burning with a partner agency, Fire Dept, or contracted services is more feasible.
							2011	Ongoing	$0	no	$0	Incomplete	Low priority.
							2012	Ongoing	$5,000	no	$0	Incomplete	Funded not needed until Fire Plan updated.
Stream Bank Stabilization	Yes	CONS-22	Funds will be used to stabilize and harden eroded stream banks of several streams where they exit at the training site.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090008	CWA, Sikes Act, Army Regulation	2008	Ongoing, newly listed project	$20,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$20,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2011	Ongoing	$10,000	no	$0	Incomplete	Ongoing next year pending funding.
							2012	Ongoing	$10,000	yes	$0	Incomplete	Unable to obligate due to lack of staff. Used funds for other NR projects.
Wetland Delineation	No	CONS-23	Funds will be used to delineate wetlands in support of RTLS development projects and training missions.	Proponent Pays	Various	CWA, Sikes Act, Army Regulation	2008	Ongoing		yes	$19,867	Complete	RDP EA support via STEP procject
							2009	Ongoing		NA	$0	NA	
							2010	Ongoing	As Required	yes	$10,667	Complete	Non-ENV funds. Southern half of TTB delin. + MRF Range construction delin.
							2011	Ongoing		yes	?	Complete	South Dig Site Expansion and McKibben Connector delins as part of A&E design work. Funding unknown.
							2012	Ongoing		yes	$20,046	Complete	MRMG & CPQC delineation. STEP project OH430110002. North dig site and TVMA delin as part of A&E design contract.

Table 17. Implementation Projects 2008 – 2012* — Last Updated 1 November 2012

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Wetland Mitigation	No	CONS-24	When avoidance is not possible, funds will be used to obtain CWA Sec 404 wetland fill permits and Sec 401 clean water certifications and to design and construct wetland mitigation projects.	Proponent Pays	Various	CWA, Sikes Act, Army Regulation	2008	Ongoing		NA	$0	Complete	Partnered with BRAC restoration project to get free wetland mitigation. 5 Year monitoring paid under a separate FY07 project.
							2009	Ongoing		NA	$0	NA	
							2010	Ongoing	As Required	yes	$25,175	In Progress	MRF/Zero Range fill permit. Funded by Training.
							2011	Ongoing		NA	$0	NA	
							2012	Ongoing		yes	$47,894	In Progress	Wetland restoration for perimeter fence line clearing. STEP project OH430120002. Include 3 years of monitoring.
Conservation Staff Training	Yes	CONS-25	Funds will be used to support travel and professional training for NR management staff.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OHB64060004	Sikes Act, Army Regulation	2008	Ongoing newly listed project	$3,500	yes	?	Complete	
							2009	Ongoing	$2,000	yes	?	Complete	
							2010	Ongoing	$2,500	yes	?	Complete	
							2011	Ongoing	$5,000	no	NA	Incomplete	Not a priority in reduced budget.
							2012	Ongoing	$7,600	yes	$317	Partial	
Soil Management	Yes	CONS-26	Funds will be used to support protection and management of training site soils to include planning, erosion control, leveling, soil amendments, and re-vegetation to meet NPDES permit requirements and soils management goals of the INRMP.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090008	CWA, Sikes Act, Army Regulation	2008	Ongoing	$15,000	no	$0	Partial	Put requiremnt on contractors and do some with in-house staff.
							2009	Ongoing	$15,000	no	$0	Partial	Put requiremnt on contractors and do some with in-house staff.
							2010	Ongoing	$15,000	no	$0	Partial	Put requiremnt on contractors and do some with in-house staff.
							2011	Ongoing	$15,000	no	$0	Partial	Put requiremnt on contractors and do some with in-house staff.
							2012	Ongoing	$15,000	no	$0	Partial	house staff.
Surface Water Quality Monitoring	Yes	CONS-27	Funds will be used to implement USGS surface water quality monitoring recommendation to ensure training activity is not degrading surface water quality.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430090009	CWA, Sikes Act, Army Regulation	2008	Ongoing	$15,000	no	$0	Incomplete	Ongoing next year pending funding.
							2009	Ongoing	$15,000	no	$0	Incomplete	Ongoing next year pending funding.
							2010	Discont.	$15,000	no	$0	Incomplete	STEP project disapproved
							2011	Discont.	$15,000	no	$0	Incomplete	STEP project disapproved
							2012	Discont.	$15,000	no	$0	Incomplete	STEP project disapproved
INRMP Update or Revision	Yes	CONS-28	Funds will be used for updates and major revisions to the INRMP as needed.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430060006	Sikes Act, Army Regulation	2008	Ongoing, newly listed project	$5,000	no	$0	Partial	Done in-house. GIS and mapping not done.
							2009	Ongoing	$5,000	no	$0	Partial	Done in-house. GIS and mapping not done.
							2010	Ongoing	$5,000	no	$0	Partial	Done in-house. GIS and mapping not done.
							2011	Ongoing	$5,000	no	$0	Partial	Done in-house. GIS and mapping not done.
							2012	Ongoing	$40,000	yes	$32,471	In Progress	
Salaries for Conservation Staff	Yes	CONS-29	Funds will be used to pay the salaries and benefits of OHARNG conservation staff.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OHB64060002	Sikes Act, Army Regulation	2008	Ongoing, newly listed project	$155,000	yes	?	Complete	Need more staff.
							2009	Ongoing	$160,000	yes	?	Complete	Need more staff.
							2010	Ongoing	$171,000	yes	$171,000	Complete	Need more staff.
							2011	Ongoing	$170,000	yes	$190,775	Complete	Need more staff.
							2012	Ongoing	$242,000	yes	$210,374	Complete	Contracted NR Manager hired. Part of contract in cost.

Table 17. Implementation Projects 2008 – 2012*

Last Updated 1 November 2012

Project Name	STEP Must Fund	Type and Number	Project Description	Fund Type	STEP Project Number	Legal Driver	Plan Date	Status Compared to 2001 INRMP	Estimated Cost	Funded	Actual Obligation	Completion Status	Comments
Wetland Mitigation Monitoring	Yes	CONS-30	Funds will be used for required wetland mitigation monitoring and reporting to regulatory agency.	Conservation (Appropriation 2065, Master Cooperative Agreement)	OH430080002 OH430100004		2008	Ongoing, newly listed project		NA	$0	Complete	Monitoring for Camp Perry and Ravenna Rt 80 mitigation sites funded for 5 year period with FY07 funds. CP - $21,000. Rt 80 - $31,000.
							2009	Ongoing	As Required	NA	$0	Complete	Rt 80 site. Approx. $6,000 FY7 funds.
							2010	Ongoing		NA	$0	Complete	Rt 80 site. Approx. $6,000 FY07 funds.
							2011	Ongoing		NA	$0	Complete	Rt 80 site. Approx. $6,000 FY07 funds.
							2012	Ongoing		NA	$0	NA	No monitoring during this 5-FY period. MKF Range and MPMG Range mitigation monitoring coming in next couple years.
Update CRJMTC Soldier's Environmental Handbook	No	ITAM-1	[illegible] copies of the existing environmental information booklet given out to soldiers who train at the RTLS so that it is current, accurate, and useful in helping the OHARNG maintain sustainable training land.	ITAM (Appropriation 2065, Master Cooperative Agreement)	NA	Sikes Act, Army Regulation	2008	Ongoing	$2,000	yes	$0	Complete	Updated in-house. Contracted printing.
Vegetation Management	No	SRM-1	Funds will be used to contract the herbicide applications portion of vegetation control activities at the RTLS.	SRM (Appropriation 2065, Master Cooperative Agreement)	NA	Sikes Act, Army Regulation, FIFRA	2008	Ongoing	$65,000	no	$0	Incomplete	Not funded by facilities. Some in-house work done.
							2009	Ongoing	$70,000	no	$0	Incomplete	Not funded by facilities. Some in-house work done.
							2010	Ongoing	$95,000	yes	$94,732	Complete	Non_ENV funds. Some work done in FY10. Balance to be done in FY11. Some in-house work done.
							2011	Ongoing	$100,000	yes	$137,127	In Progress	Non-ENV funds.
							2012	Ongoing	$100,000	no	$0	In Progress	Continued control with FY11 funding.

*Anticipated projects needed to implement INRMP programs from FY08 through FY12.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
1. Manage natural resources in a manner that is compatible with and supports the military mission while complying with applicable Federal and State laws and Army regulations and policies.	1.1: Initiate programs and projects that enhance the training land and training opportunities and/or do not unnecessarily limit training land availability.	1.1.1: Provide a trained natural resources staff to develop and manage the natural resources program and to provide support to the military staff. (CONS-10, CONS-25, CONS-29)	Environmental Supervisor has managed the program for 24 years but unable to keep up. Contracted Natural Resource Manager hired in 2012.
		1.1.2: Coordinate INRMP revisions and implementation with Camp Ravenna operations, range control, and maintenance staffs. (CONS-28)	Recurring coordination of INRMP implementation with Camp Ravenna staff. Difficult at times due to limited staff and heavy maintenance, site development, project and environmental workloads.
		1.1.3: Identify and comply with regulatory driven land use limitations associated with natural resources such as wetlands, federally listed threatened and endangered species, and others. (CONS-28)	Wetlands are the biggest natural resources issue impacting training and development of Camp Ravenna. Several wetland delineations completed with Ohio EPA and USACE coordination. One 401 wetland permit obtained from Ohio EPA and mitigation completed. One 404/401 wetland permit in progress. One wetland modification completed without a permit and wetland restoration contracted and in progress. Indiana bat is the second major issue with potential to impact operations and projects. The current INRMP strategy implementation is working well. Surface water management has also been an issue in the last few years. We are working with the Ohio EPA on storm water discharge issues form our Engineer Dig Site and in process of obtaining an Individual NPDES Permit. The training site staff has been very supportive of the ENV staff in correcting deficiencies and trying to be proactive in managing and preventing problems. Training activity and development siting is reviewed based on multiple factors to include mission requirements and minimizing environmental impact.
	1.2: Continue to educate Camp Ravenna users regarding the natural resources at Camp Ravenna and their part in ensuring sustainable use of the site in perpetuity.	1.2.1: Update and produce copies of the existing environmental information booklet given out to soldiers who train at Camp Ravenna so that it is current, accurate, and useful in helping the OHARNG maintain sustainable training land. (ITAM-1)	Booklet was updated in-house, printed by an outside contractor, and is distributed to soldiers upon arrival.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
2. Maintain and foster positive working relationships with the U. S. Fish and Wildlife Service, the ODNR DOW, and other federal, state and local natural resources management agencies and organizations for the benefit of the military mission, the natural resources being managed, and the citizens of Ohio and the nation.	2.1: Effectively communicate mission needs to cooperating agencies and solicit input/review on projects with the potential to impact natural resources, especially in areas of regulatory primacy. (CONS-28)		Annual reviews and Review for Operation and Effect completed in coordination with USFWS, Ohio DNR/DOW, and Camp Ravenna staff. ESA Sec 7 coordination completed with USFWS as required. Ohio DNR consulted for PCNs. Annual coordination with DOW on deer hunt and Youth turkey hunting (when available). Coordinate with DOW on bear sighting/ trapping, duck banding, otter survey, turkey survey, and aerial deer count. Also work with USACE and Ohio EPA regarding wetland issues.
	2.2: Provide copies of biological surveys to interested cooperating agencies.		2010 updated biological surveys provided to the Ohio DOW and the USFWS.
	2.3: Facilitate cooperative management programs and projects that are compatible with the military mission and within the capabilities of the Camp Ravenna staff. (CONS-28)		The annual public deer hunt is our main cooperative program. We also have a couple of youth turkey hunt days when possible. Due to training activity youth turkey hunts were not conducted in 2011 and 2012. Training activity is increasing so public access programs are becoming more difficult to facilitate. We cooperate with the DOW on other activities as described in 2.1 above.
3. Monitor the condition of the natural resources and the implied impacts from training and the natural resources management program on the natural resources at Camp Ravenna.	3.1: Maintain current species inventories and other PLSs through periodic reoccurring surveys and inventories.	3.1.1: Conduct annual breeding bird surveys on established breeding bird routes. The survey will identify nesting birds at Camp Ravenna in accordance with established national BBS protocols and identify significant upward or downward trends in the breeding bird population. (CONS-1)	Annual Breeding bird surveys were conducted in 2008-2012, on established breeding bird routes. The surveys identified nesting birds at Camp Ravenna in accordance with established national breeding bird survey protocols and identified significant upward or downward trends in the breeding bird population. Additionally in 2010 the ODNR performed a basewide bird survey in 2010.
		3.1.2: Conduct a training site-wide survey for the endangered Indiana bat every five years. If the Indiana bat or any other federally listed species is found, consultation with the USFWS will begin and the survey schedule modified as appropriate. (CONS-14)	Bat Survey initiated in 2009 and completed in 2010, Survey report dated November 2010.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
3. Monitor the condition of the natural resources and the implied impacts from training and the natural resources management program on the natural resources at Camp Ravenna.	3.1: Maintain current species inventories and other PLSs through periodic reoccurring surveys and inventories.	3.1.3: Conduct inventories of bird, herptile, and Lepidoptera species every five years to update existing data and monitor ecosystem for changes. (CONS-15)	Surveys conducted in 2010. Monitoring of ecosystem changes is largely based on discussions with biologists doing the surveys. Most of them have been doing the surveys since the early 1990's. Observations by the Environmental staff also contribute to monitoring efforts. Based on observations there have been no negative ecosystem impacts in the last 5 years. Vegetation is changing – more forest and some very thick shrub habitat but plant and animal communities are generally more diverse and robust than the areas surrounding Camp Ravenna.
		3.1.4: Conduct inventories of plants, plant communities, mammals, bird, mollusks and crayfish, and fish species every ten years to update existing data and monitor ecosystem for changes. (CONS-15, CONS-16)	Surveys conducted in 2010. Plant Communities survey update eliminated due to lack of funding.
4. Protect and maintain populations of rare plant and animal species on Camp Ravenna in compliance with Federal and State laws and regulations.	4.1: Avoid negative impacts to federally listed species and avoid/minimize impacts to State listed and otherwise rare species.	4.1.1: Review Camp Ravenna development plans and military training activities in light of biological survey data and site projects and training in locations that best meet mission needs, avoid negative impacts to federally listed species, and minimize impacts to state listed and other rare species. (CONS-15, CONS-16)	The Camp Ravenna Master Plan was completed in 2009. Environmental was a key component in Master Plan development. The Range Development Master is reviewed annually. Environmental was key in development of the range development plan and range siting as well and continues to be coordinated with as range construction and other construction and training projects are initiated. A record of environmental consideration (REC) is completed for each project as applicable.
		4.1.2: Implement a vegetation control plan that is effective at maintaining Camp Ravenna grounds and infrastructure and minimizes disturbance to nesting birds and other species. (SRM-1)	It has been difficult to implement the INRMP mowing plan due to internal staff communication issues. Timing of mowing expanse areas to avoid impacts on nesting birds has improved and the new Natural Resources Manager on staff should help us improve even more.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
4. Protect and maintain populations of rare plant and animal species on Camp Ravenna in compliance with Federal and State laws and regulations.	4.1: Avoid negative impacts to federally listed species and avoid/minimize impacts to State listed and otherwise rare species.	4.1.3: Implement Camp Ravenna INRMP strategies to maintain large tracts of forest and other habitat types to maintain diversity. (Multiple CONS Project #s)	A few brush areas have been converted to grassland in the last 5 years and most of our grassland management areas established. Grassland management contracts were issued in 2010 and 2012. We are cooperating with the USFWS Lower Great Lakes Woodcock and Young Forest Initiative to retain selected areas as early successional forest. A contract for this project was let in 2012. The areas will be reviewed and re-cut every 5 to 10 years as necessary. Forestland acreage is by far our most abundant habitat. The acreage is steady to slightly increased. A few minor clearings were done but no large clearing projects were completed.
		4.1.4: When using controlled burns, only burn a portion of any given habitat type at a time in order retain certain Lepidoptera species that overwinter in the grass. (CONS-6, CONS-11, CONS-21)	No burns were completed since the last INRMP update. Grasslands were maintained by mowing. Due to lack of staff for proper oversight, most grasslands were mowed at the same time leaving little grassland standing during years mowing was done. Need to improve our mowing rotation for grassland areas to retain a steady amount of standing grass in winter.
5. Sustain usable training lands and native natural resources by managing non-native and invasive species, vegetation and plant communities, and nuisance wildlife species.	5.1: Manage populations of invasive plant species where they hinder training and/or habitat management objectives.	5.1.1: Control purple loosestrife, multiflora rose, Russian olive, autumn olive, and other invasive / noxious weeds identified throughout the INRMP implementation period. (CONS-12)	Phragmites and Japanese Knotweed control in 2009 and 2010. Ailanthus and Japanese Knotweed control in 2012. Roadside invasive species survey in 2013 and second treatment in 2013. 2012 was the first year for implementation of a concerted effort to identify and control invasive plant species.
	5.2: Manage non-native and invasive insect species that pose a threat to forest resources.	5.2.1: Cooperate with the USFS forest insect and disease monitoring efforts.	USFS conducted annual aerial insect and disease defoliation surveys as their funding permitted. No defoliation problems were identified.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
5. Sustain usable training lands and native natural resources by managing non-native and invasive species, vegetation and plant communities, and nuisance wildlife species.	5.2: Manage non-native and invasive insect species that pose a threat to forest resources.	5.2.2: Implement forest management strategies identified in the Camp Ravenna INRMP and manage for vigorous and diverse forest communities. (CONS-1, CONS-2, CONS-13)	Forest management activities to include timber stand improvement and timber harvests conducted as scheduled with the exception of no timber harvest in 2012 due to lack of staff. Forest management strategy is to utilize stand improvement treatments such as grapevine control, cull tree deadening and crop tree release to improve growing conditions and retain species diversity. Timber harvesting is mostly single tree and group selection and commercial crop tree release, which retain a fully stocked stand. Specific consideration is given to retain wildlife trees/habitat and to providing conditions for regeneration of shade mid-tolerant species. Most harvests are improvement cuts in stands that are not yet mature and regenerating. At some point in the future heavier cutting and the use of fire will be needed to encourage oak and shade intolerant species regeneration.
	5.3: Manage terrestrial vegetation to support training, encourage native plant communities, and prevent damage to training site facilities and infrastructure.	5.3.1: Develop an Integrated Wildland Fire Management Plan and conduct controlled burns for fuel reduction and grassland management on ranges and other grassland areas. (CONS-11, CONS-20, CONS-21)	Wildland Fire Management Plan completed in 2009 by the USFS via a NGB National Contract. The Wildland Fire Management Plan part of the INRMP by reference. The plan does not contain a good burning schedule. Funding available in 2013 to have the plan updated. Intend to update the plan and implement via contracts with TNC or MOA with Ohio DNR/DOF/DOW.
		5.3.2: Improve dismounted maneuver areas by managing grassland habitat and converting non-native grasslands to native grasses by mowing, burning, and seeding with native grasses. (CONS-6, CONS-20)	Brush has been cut and most of the grassland management areas established. Dismounted maneuver is limited because the soils are prone to rutting and surface water controls are needed. Dry season maneuver is possible. Still need to do some clearing in Training Area 33.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
5. Sustain usable training lands and native natural resources by managing non-native and invasive species, vegetation and plant communities, and nuisance wildlife species.	5.3: Manage terrestrial vegetation to support training, encourage native plant communities, and prevent damage to training site facilities and infrastructure.	5.3.3: Control vegetation around buildings, on railroad tracks, in power line rights-of-way, in road ditches, road surfaces, around mowing obstructions, in parking lots, under fence lines and fence line clear zones, and any other facility areas. (SRM-1)	The Camp Ravenna mowing staff and equipment are not adequate for vegetation control needs. Improvement is needed in designation and implementation of mowing priorities. Contracted herbicide applications were conducted in 2009, 2011 and 2012. Control of some areas has been obtained but require ongoing maintenance applications. The 2012 Ohio EPA General Permit for Surface Water Discharges from Pesticide Applications has impacted our ability to treat roadside ditches and made program administration more difficult. Vegetation control is coordinated with environmental but has been difficult to manage due to lack of staff and time.
	5.4: Manage the beaver population to prevent damage to training site facilities and infrastructure and to maintain the quality warm water habitats of Hinkley Creek, Sand Creek, and South Fork Eagle Creek.	5.4.1: Implement a beaver trapping/control program per the Camp Ravenna INRMP to remove beaver damaging roads, culverts, and other facilities and those damming the main channels of Hinkley Creek, Sand Creek, and South Fork Eagle Creek. Selectively trap beaver in other areas. (CONS-4)	Beaver trapping performed annually by member of the general public. Most problem areas eliminated but there are some recurring problems. Continuous management is required.
		5.4.2: Remove beaver dam material from culverts and bridges and keep the three main streams (Hinkley Creek, South Fork Eagle Creek, and Sand Creek) free from beaver dams so as not to degrade current high quality of stream habitats. Trap beaver during trapping season and remove dams mechanically as necessary. Remove debris in side channels only if damaging government facilities and/or impeding mission capability. (CONS-8)	In-house staff has removed a few problem dams within the range complex. Funding was available in 2012 for a contracted effort but due to lack of staff to develop the contract, the funds were diverted to another INRMP project.
	5.5: Manage other nuisance animals that negatively impact the ecosystem.	5.5.1: Control feral cats, pigeons, and other species in accordance with the OHARNG Installation Pest Management Plan. (CONS-8)	No special effort was required for nuisance animal control. Coyotes seem to have the feral cat and dog populations in check, although a few feral cats were seen in 2012.
6. Manage wildlife resources in a manner compatible with the military mission and within the limits of the natural habitat.	6.1: Cooperatively manage wildlife resources with the ODOW.	6.1.1: Continue wood duck nest box program.	Implemented.
		6.1.2: Continue duck banding program.	Implemented.
		6:1.3: Continue turkey census and other census programs.	Implemented.
		6.1.4: Allow the release of captured and recovered wildlife.	Implemented.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
6. Manage wildlife resources in a manner compatible with the military mission and within the limits of the natural habitat.	6.2: Provide opportunity for wildlife recreation to the public that is compatible with the military mission.	6.2.1: Continue controlled hunting, trapping, fishing, educational, and watchable wildlife activities. (CONS-4, CONS-5, CONS-7, CONS-18)	Programs continued annually 2008-2012.
	6.3: Maintain wildlife population without augmenting the habitat with artificial food plots.	6.3.1: Implement the Camp Ravenna INRMP management strategies to maintain diverse habitats and native plant communities capable of supporting wildlife populations. (Multiple CONS Project #s)	No artificial food plots established. Implemented strategies within INRMP to maintain native plant communities and wildlife populations.
7. Manage Camp Ravenna whitetail deer population in a manner that minimizes impacts on the military mission, is ecologically sustainable, provides for public hunting, and is in accordance with Army regulations and State law.	7.1: Census the deer herd.	7.1.1: Fund the ODOW to conduct a winter aerial census of Camp Ravenna deer herd. (CONS-17)	Aerial deer surveys conducted by ODOW 2008-2010. Survey not conducted in 2011 due to lack of suitable snow cover in February. 2012 survey pending. MOA with DNR/DOW developed to fund survey at up to $1,500/yr.
		7.1.2: Conduct a road side deer survey of Camp Ravenna the last two weeks in August each year to determine the ratio between bucks and does and does and fawns.	Selected Camp Ravenna staff conducted surveys.
		7.1.3: Conduct deer browse surveys in summer if warranted.	Not necessary to implement.
	7.2: Determine winter carrying capacity for whitetail deer at Camp Ravenna.	7.2.1: Using the Camp Ravenna Plant Communities Survey, vegetative field sampling, and scientific literature determine the winter carrying capacity of the Camp Ravenna deer herd. (CONS-19)	Utilizing generally accepted capacity of approximately 20-30 deer per square mile. More in-depth research pending funding. Would like to partner with a university and make this a graduate student project.
	7.3: Maintain the white-tailed deer population at or near carrying capacity and at a buck to doe ratio close to 1:2 (acceptable ratio is dependent on population size) with a maximum of six hunters dates per year.	7.3.1: Use controlled public access hunting to manage the deer herd. (CONS-4)	Implemented IAW INRMP.
		7.3.2: Determine and issue the number of antlerless only and either sex deer permits necessary to bring the herd down to winter carrying capacity within the available number of hunt days.	Implemented IAW INRMP.
		7.3.3: Manage deer hunt areas by maintaining signage, boundary markings, mowing parking areas, and mowing access lanes into hunt areas. (CONS-5)	Minimal effort expended on this due to lack of staff. Many signs are in poor condition and in need of replacement. Hunt parking areas usually are mowed incidental to roadside mowing but not all areas that require mowing are mowed. Access lanes through thick brush are not being mowed. Some funding was available for this but was used 100% for grassland habitat mowing due to lack of staff and inability to develop a scope of work and issue a contract.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
7. Manage Camp Ravenna whitetail deer population in a manner that minimizes impacts on the military mission, is ecologically sustainable, provides for public hunting, and is in accordance with Army regulations and State law.	7.3: Maintain the white-tailed deer population at or near carrying capacity and at a buck to doe ratio close to 1:2 (acceptable ratio is dependent on population size) with a maximum of six hunters dates per year.	7.3.4: Manage the VE program to facilitate public access to Camp Ravenna for deer hunting.	Implemented IAW INRMP.
8. Manage forest resources to the benefit of the military mission, to perpetuate the ecosystem functions, to support regional ecosystem needs, and for the production of forest products.	8.1: Maintain current forest resource data.	8.1.1: Conduct a GIS-compatible forest inventory of Camp Ravenna. The work will include revising the existing GIS Forest Management Map and linking the new forest inventory data to this map. (CONS-13)	An inventory was completed in 2011, but the data is suspect. A GIS linked map could not be developed within the available project funding. The designation of forest stands, stand acreages, field data and resulting stand volume calculations are all suspect. The inventory is not considered a reliable source of information. The old forest inventory with growth projections and Cutting Unit designations will continue to be used and funding for a new forest inventory requested.
	8.2: Implement forest management strategies identified in the Camp Ravenna INRMP.	8.2.1: Conduct timber stand improvement. (CONS-2)	Implemented IAW INRMP.
		8.2.2: Conduct timber harvests. (CONS-2)	Implemented IAW INRMP with the exception that a timber harvest was not conducted in 2012 due to lack of staff.
		8.2.3: Conduct minor forest products sales.	Firewood permit and contract sales conducted in timber harvest areas, blow down areas and areas where trees are a hazard or maintenance concern. Intend to expand program to include biomass sales as markets are available and when such activities are needed to support the mission and/or implementation of the INRMP.
9. Manage wetlands and other surface waters in accordance applicable Federal, State, and local regulations and to protect water quality and ecological functions while facilitating the military mission.	9.1: Avoid wetland fills.	9.1.1: Conduct wetland delineations and ORAM determinations prior to new construction or other ground disturbing activities so projects can be designed to avoid wetlands. (CONS-23)	Delineations conducted on an as-needed basis for new projects. Including: Southern half of TTB and MRF Range delineations in 2010, South Dig Site McKibben Connector, MPMG, and CPQC delineations in 2011, and North Dig Site, TVMA, MPMG Range, CPQC and Fire and Maneuver Range delineations in 2012.

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Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
9. Manage wetlands and other surface waters in accordance applicable Federal, State, and local regulations and to protect water quality and ecological functions while facilitating the military mission.	9.2: Minimize and mitigate unavoidable wetland fills.	9.2.1: Obtain Section 404 wetland fill permits and Section 401 WQC prior to any fill. (CONS-24)	MRF/Zero Range permit in progress. Expect permit to be issued in 2013. Also working on a permit for the MPMG Range. Expect this permit to be issued in 2014. Failed to obtain permit for clearing of a grown over fence line that was cleared to upgrade the deteriorated/missing old fence from barbed wire to chain-linked, barbed wire topped fence.
		9.2.2: Implement the required wetland mitigation per the 404/401 permits. (CONS-24)	Mitigation is in progress. There are four wetland mitigation sites on Camp Ravenna. These sites are required to be maintained and retained as wetlands in perpetuity. This is normally done with conservation easements and/or deed restrictions. Such covenants cannot be placed on Army property. In order to protect these sites, they will be identified in an Appendix to the INRMP. A description will describe the mitigation and the associated wetland permit and site restrictions/ retention requirements. A map of each site will be included. The appendix will be updated as new mitigation sites are added or other updates are needed. The information will also be provided to the OHARNG Master Planner for insertion into the Camp Ravenna Master Plan.
	9.3: Maintain healthy aquatic ecosystems in ponds.	9.3.1: Manage aquatic vegetation in ponds that support a fishery. (CONS-18)	Not implemented due to lack of staff.
		9.3.2: Repair damaged earthen dikes and dams and pond access roads. (CONS-7)	Not implemented due to lack of staff.
	9.4: Restore, enhance and create wetlands when possible and compatible with the military mission.	9.4.1: Cooperate with the ODOT with mutually beneficial wetland mitigation project at Camp Ravenna for transportation projects.	No request received from ODOT. Implementation not necessary.
		9.4.2: Encourage wetland protection and restoration in conjunction with the RVAAP environmental restoration and facilities demolition programs.	Implemented. Developed wetland mitigation in conjunction with cleanup up a of restoration sites. Coordinated wetland protection and stream restoration on a couple of other restoration sites.
		9.4.3: Encourage construction of wetlands as engineer training projects and in association with Camp Ravenna development projects.	The opportunity has not presented itself for implementation of this project/ strategy.

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Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
10. Manage soil to maintain productivity and prevent and repair erosion in accordance with State and Federal laws and regulations so that Camp Ravenna can support doctrinally required military training in perpetuity.	10.1: Conduct training and other activities in locations with soil most suitable for supporting the activity.	10.1.1: Reference the Camp Ravenna soil survey and soil suitability and limitations when siting training and other activities.	Implemented when possible. Most of the available training areas at Camp Ravenna are so poorly drained that we have to make do with what we have and implement BMP's to prevent/ minimize erosion and restore damage.
	10.2: Rehabilitate, repair, and maintain areas damaged by training and other activities.	10.2.1: Repair soil damage caused by off road vehicle traffic. (CONS-26)	The land rehabilitation program in ITAM is responsible for this. Due to limited staff, equipment and funding it has been difficult to repair damage. We have been trying to avoid damage by training within land/ soil capability as much as possible. Still there is some rutting in the TVMA and some project areas that will develop into wetlands if not repaired. Erosion is not generally bad because most of the Camp Ravenna soils are not highly erodible. We do have a major erosion management project in place for the Engineer Dig Site.
		10.2.2: Implement BMPs for stream crossings and operations within riparian areas. (CONS-26)	Streams are only crossed with vehicles at culvert, bridges, or other hardened crossing locations. Several culvert and bridges have been replaced or repaired and additional repairs/ replacements are underway and planned.
		10.2.3: Stabilize and harden eroded stream banks of several streams where they exit the training site. (CONS-22)	Funding was available to initiate this project in FY12 but unable to be executed due to lack of staff.
		10.2.4: Maintain vegetative cover on soil and comply with Ohio NPDES storm water management requirements for construction projects and other activities that create bare ground. (CONS-26)	Implemented IAW INRMP and applicable NPDES permits.
		10.2.5: Maintain tank trails by filling and grading damaged roads, maintaining sedimentation ponds, repairing ditches as necessary, and using palliatives for dust control.	Implementation completed as needed.
11. Manage cultural resources on Camp Ravenna in accordance with State and Federal laws and regulations while implementing the natural resources management program.	11.1: Comply with Federal, State, and local laws and regulations pertaining to cultural resources found on the training site.	11.1.1: Conduct archeological surveys in support of timber harvests and other ground disturbing activities. (CONS-3)	Surveys completed on 576 acres in 2008, 388 acres in 2009, 560 acres in 2010, 388 acres in 2011, and 2012 in contract negotiation.
		11.1.2: Using the archaeological survey results, determine if any actions will impact resources eligible for listing in the NRHP. Modify projects to avoid impacts or mitigate the impacts in consultation with the SHPO. (CONS-3)	Implemented IAW NHPA. No impacts to historic resources.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
12. Develop, maintain, and manage data regarding natural resources at Camp Ravenna through the use of GIS for efficient data storage, retrieval, analysis, and presentation.	12.1: Develop accurate and usable natural resources GIS data.	12.1.1: Incorporate existing breeding bird data, deer hunt data, and other natural resources data that exists only on paper or as non-GIS electronic data into GIS. (CONS-9)	GIS support has been minimal because the OHARNG GIS staff is in Columbus. None of the GIS data generated for wetland delineations, biological surveys or other natural resources projects/ programs is routinely and regularly integrated into the INRMP data base and the Natural Resources manager does not have visibility of the database. We are working to improve. New aerial photographs were provided by ARNG in 2010.
		12.1.2: Revise and consolidate existing GIS files as more current data becomes available and when analysis warrants. (CONS-9)	Revision and update will accompany 2012-2013 INRMP Review Process.

STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

30 September 2013

Environmental Office

LTC William Meade
CRJMTC
1438 State Route 534 SW
Newton Falls, OH 44444

Subject: Draft Updated Camp Ravenna Joint Military Training Center (Camp Ravenna) Integrated Natural Resource Management Plan (INRMP) Submittal Notification

Dear LTC Meade,

In accordance with the Review for Operation and Effect of the Camp Ravenna INRMP that we conducted on 19 December 2012, the Ohio Army National Guard (OHARNG) has updated the 2008 Camp Ravenna INRMP for continued implementation through calendar years 2013-2017. We apologize that it has taken us almost a year to get this draft update to you, but a heavy work load hindered our ability to complete it any sooner. It is the intent of the OHARNG to submit the updated portions of the INRMP to your agency for review and comment 60 days from the date this letter. We realize that everyone is busy, so we will highlight or otherwise designate what has been updated to help expedite your review. Once we have a final update, we will solicit a new concurrence memo from your agency and will send you both a hard and an electronic copy of the complete updated INRMP.

Should you have any questions please feel free to contact the undersigned at 614-336-4564 or via email at brian.p.riley17.ctr@mail.mil.

Thank you,

Brian P. Riley
OHARNG Natural Resources Manager

STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

30 September 2013

Environmental Office

John Kessler, P.E.
Ohio Department of Natural Resources
2045 Morse Rd.,
Columbus, OH 43229-6605

Subject: Draft Updated Camp Ravenna Joint Military Training Center (Camp Ravenna) Integrated Natural Resource Management Plan (INRMP) Submittal Notification

Dear Mr. Kessler,

In accordance with the Review for Operation and Effect of the Camp Ravenna INRMP that we conducted on 19 December 2012, the Ohio Army National Guard (OHARNG) has updated the 2008 Camp Ravenna INRMP for continued implementation through calendar years 2013-2017. We apologize that it has taken us almost a year to get this draft update to you, but a heavy work load hindered our ability to complete it any sooner. It is the intent of the OHARNG to submit the updated portions of the INRMP to your agency for review and comment 60 days from the date this letter. We realize that everyone is busy, so we will highlight or otherwise designate what has been updated to help expedite your review. Once we have a final update, we will solicit a new concurrence memo from your agency and will send you both a hard and an electronic copy of the complete updated INRMP.

Should you have any questions please feel free to contact the undersigned at 614-336-4564 or via email at brian.p.riley17.ctr@mail.mil.

Thank you,

Brian P. Riley
OHARNG Natural Resources Manager

STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

30 September 2013

Environmental Office

Scott Peters
Wildlife Management Supervisor
Ohio Division of Wildlife
912 Portage Lakes Drive
Akron, Ohio 44319

Subject: Draft Updated Camp Ravenna Joint Military Training Center (Camp Ravenna) Integrated Natural Resource Management Plan (INRMP) Submittal Notification

Dear Mr. Peters,

In accordance with the Review for Operation and Effect of the Camp Ravenna INRMP that we conducted on 19 December 2012, the Ohio Army National Guard (OHARNG) has updated the 2008 Camp Ravenna INRMP for continued implementation through calendar years 2013-2017. We apologize that it has taken us almost a year to get this draft update to you, but a heavy work load hindered our ability to complete it any sooner. It is the intent of the OHARNG to submit the updated portions of the INRMP to your agency for review and comment 60 days from the date this letter. We realize that everyone is busy, so we will highlight or otherwise designate what has been updated to help expedite your review. Once we have a final update, we will solicit a new concurrence memo from your agency and will send you both a hard and an electronic copy of the complete updated INRMP.

Should you have any questions please feel free to contact the undersigned at 614-336-4564 or via email at brian.p.riley17.ctr@mail.mil.

Thank you,

Brian P. Riley
OHARNG Natural Resources Manager

THE ADJUTANT GENERAL'S DEPARTMENT
RAVENNA TRAINING AND LOGISTICS SITE
1438 State Route 534 SW
Newton Falls, OH 44444

AGOH-RTLS-EN 3 August 2005

Ms. Rachel M. Tooker, SHPO
Ohio Historic Preservation Office
567 E Hudson Street
Columbus, OH 43211-1030

Subject: Intergovernmental and Interagency Environmental Planning Consultation, Ohio Army National Guard (OHARNG) Ravenna Training and Logistics Site (RTLS) Integrated Natural Resource Management Plan (INRMP) Revision

Dear Ms. Tooker,

The Ohio Army National Guard (OHARNG) is updating its October 2001 *Integrated Natural Resources Management Plan* (INRMP) for the Ravenna Training and Logistics Site (RTLS). This INRMP is required by Army Policy to reflect the mutual agreement of the U.S. Fish and Wildlife Service (USFWS) and the State fish and wildlife agency concerning conservation, protection and management of fish and wildlife resources. In Ohio, this agency is the Ohio Department of Natural Resources (ODNR) Division of Wildlife (DOW).

The purpose of the INRMP is to document the policies and desired future direction of OHARNG's natural resources management program at the training site. The INRMP describes the baseline conditions of natural resources and provides management programs and guidance allowing for the successful completion of the military mission, while providing for the conservation of renewable natural resources, preservation of rare and unique resources, and long-term sustainability of a highly diversified ecosystem. The natural resources have been actively managed at the RTLS since the 1950's and the earliest copy of a management plan is from the mid-1960's. The current revision is a continuation of a successful program that over the years has enabled a combination of diverse ecosystems to develop while providing for multiple uses of natural resources.

The RTLS is a military training site managed by the OHARNG that encompasses approximately 21,419 acres in Portage and Trumbull Counties, Ohio (see attached figure). The land of the installation has been divided into three land use classifications, improved, semi-improved, and unimproved grounds. Improved grounds are those intensively maintained and usually include cantonment areas. The RTLS headquarters area in the southeastern corner of the installation is the only area classified improved grounds. There are approximately 20 acres of improved grounds. Semi-improved grounds are those areas that receive some maintenance but are not as intensively maintained as improved grounds. These areas include ranges and other training areas, active ammunition storage areas, and other similar areas. A total of 2,810 acres are classified as semi-improved Grounds. Unimproved grounds are those that receive little or no regular maintenance. The bulk of the RTLS acreage fits into this category. There are approximately 15,004 acres of unimproved land. Unimproved land at the RTLS includes a variety of habitats, including large tracts of closed-canopy hardwood forest, scrub/shrub open areas, grasslands, wetlands, open-water ponds and

lakes. At acquisition in 1939/40, the RTLS was approximately 90 percent agricultural land. The RTLS is now mostly forested.

The OHARNG has conducted a number of detailed environmental, biological, and cultural resources surveys over the last several years and has a wealth of information on hand about flora and fauna species, plant communities, wetlands, surface water quality, topography, and cultural resources. We are a partner in a project to digitize the soils data for Portage County and are awaiting completion of that project. The INRMP will reference the OHARNG's July 2002 Integrated Cultural Resources Management Plan and incorporate additional information from ongoing cultural resources studies.

A one-day agency coordination meeting is scheduled for **10:30 a.m., September 22, 2005 at the RTLS Headquarters building, 1438 State Route 534 SW, Newton Falls, OH 44444.** The purpose of the meeting is to hear the concerns and ideas of each agency regarding natural resources at the RTLS and their management. These concerns will be discussed in an open, constructive format to provide input into the revision of the INRMP. An agenda and site map are attached.

We look forward to and welcome your participation in this INRMP revision process. Your response on or before **1 September 2005** will enable us to complete this phase of the project within the scheduled timeframe. Please send your correspondence directly to AMEC at the following address:

Jennifer Pyzoha
AMEC Earth & Environmental, Inc.
659 High Street, Suite 201
Worthington, Ohio 43085

If you have any questions concerning this request, please do not hesitate to contact Jennifer at (614) 430-0487 or the undersigned at (614) 336-6568.

Sincerely,

Timothy M. Morgan, CF
Environmental Supervisor
Ravenna Training and Logistics Site

Enclosures

Cc: file
Jennifer Pyzoha, AMEC Earth & Environmental, Inc.
MAJ Thomas D. Daugherty, Ohio Army National Guard

CONTACT LIST

U.S. Fish and Wildlife Service
Tim Patronski, Sikes Act Regional Coordinator
US Fish and Wildlife Service Regional Office
Bishop Whipple Federal Building
1 Federal Drive
Fort Snelling, MN 55111

Dr. Mary Knapp
U.S. Fish and Wildlife Service
Ecological Services Division
6950 Americana Pkwy Suite H
Reynoldsburg, OH 43068-4127

Ohio Department of Natural Resources
Mr. Samuel W. Speck, Director
2045 Morse Rd.
Columbus, OH 43229-6693

Division of Wildlife
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693

Division of Geological Survey
2045 Morse Road, Building B
Columbus OH 43229-6693

Division of Forestry
2045 Morse Road, Building H
Columbus OH 43229-6693

Division of Soil & Water Conservation
2045 Morse Road, Building B-3
Columbus OH 43229-6693

Division of Water
2045 Morse Road, Building E
Columbus OH 43229-6693

Mr. Jarod Roof**,** Portage Wildlife Officer
Ohio Division of Wildlife District Three
912 Portage Lakes Drive
Akron, Ohio 44319

Mr. Jerrod Allison**,** Tumbull Wildlife Officer
Ohio Division of Wildlife District Three
912 Portage Lakes Drive
Akron, Ohio 44319

Mr. Greg Shneider, Group Manager
Natural Heritage Program
Division of Natural Areas & Preserves
1889 Fountain Sq. Ct., Bldg. F-1
Columbus OH 43224-1388

Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049

Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087

Natural Resource Conservation Service
Mr. Kevin Brown, State Conservationist
Natural Resource Conservation Service – Ohio State Office
200 North High Street, Room 522
Columbus, OH 43215

USDA-Natural Resource Conservation Service
Ravenna Service Center – Area Office
6970 State Route 88
Ravenna, OH 44266-9130

USDA-Natural Resource Conservation Service
Cortland Service Center – Area Office
520 W Main St
Cortland, OH 44410-1455

Trumbull County Soil and Water Conservation District
John Knapp, District Conservationist
520 W. Main Street, Suite 3
Cortland, Ohio 44410

Portage County Soil and Water Conservation District
James Bierlair - District Coordinator
6970 State Route 88
Ravenna OH 44266

Portage County Regional Planning Commission
Claudia James, Community Planner
124 North Prospect
Ravenna, Ohio 44266

Portage Park District
Christine Craycroft, Executive Director
449 S. Meridian Street
Ravenna, OH 44266

State Historic Preservation Agency
Ms. Rachel M. Tooker, SHPO
Ohio Historic Preservation Office
567 E Hudson Street
Columbus, OH 43211-1030

AGENCY COORDINATION MEETING

22 SEPTEMBER 2005
1030 hours – 1230 hours CST
OHIO ARMY NATIONAL GUARD
RAVENNA TRAINING AND LOGISTICS SITE
1438 State Route 534 SW
Newton Falls, Ohio 44444

Agenda

10:30 Welcome and Introductions

10:45 Overview of Integrated Natural Resources Management Plans

11:00 Overview of Ravenna Training and Logistics Site
- Mission and Training Requirements
- Natural Resources present
- Natural Resource Management Program

12:00 Discussion of Natural Resource Management Issues
Open discussion to hear concerns, suggestions, or recommendations from agencies regarding the INRMP revision.

12:30 Close

EMAIL INVITATION

SUBJECT: Agency Coordination Meeting for the Ravenna Training and Logistics Site (RTLS) Integrated Natural Resources Management Plan (INRMP) Revision

I am writing in regard to the scheduled agency consultation meeting at the RTLS on **22 September 2005** at **1000 AM**. Your agency was invited to this meeting in an intergovernmental and interagency environmental planning consultation letter sent in mid-August 2005. The meeting purpose is to formally review the above referenced project and discuss your concerns and ideas regarding natural resources at the RTLS. I am requesting an RSVP from the invited parties (see below for contact list).

The RTLS is located at 1438 State Route 534 SW, Newton Falls, Ohio 44444

We look forward to and welcome your participation in this project. Please contact me at (614) 430-0487 or jennifer.pyzoha@amec.com to let us know whether you or your representative will be able to attend, or if you have any questions concerning this meeting.

Sincerely,

CONTACT LIST

Tim Patronski, Sikes Act Regional Coordinator
US Fish and Wildlife Service Regional Office
Bishop Whipple Federal Building
1 Federal Drive
Fort Snelling, MN 55111
Phone: 612.713.5444

Dr. Mary Knapp
U.S. Fish and Wildlife Service
Ecological Services Division
6950 Americana Pkwy Suite H
Reynoldsburg, OH 43068-4127
Phone: (614) 469-6923

Mr. Samuel W. Speck, Director
Ohio Department of Natural Resources
2045 Morse Rd.
Columbus, OH 43229-6693

Ohio Department of Natural Resources
Division of Wildlife
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693

Ohio Department of Natural Resources
Division of Geological Survey
2045 Morse Road, Building B
Columbus OH 43229-6693
Phone: 614-265-6576

Ohio Department of Natural Resources
Division of Forestry
2045 Morse Road, Building H
Columbus OH 43229-6693
Phone: 614-265-6694

Ohio Department of Natural Resources
Division of Soil & Water Conservation
2045 Morse Road, Building B-3
Columbus OH 43229-6693
Phone: 614-265-6610

Ohio Department of Natural Resources
Division of Water
2045 Morse Road, Building E
Columbus OH 43229-6693
Phone: 614-265-6717

Ohio Environmental Protection Agency
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087
Mr. Jarod Roof, Portage Wildlife Officer

Ohio Division of Wildlife District Three
912 Portage Lakes Drive
Akron, Ohio 44319
Phone: (330) 644-2293

Mr. Jerrod Allison, Trumbull Wildlife Officer
Ohio Division of Wildlife District Three
912 Portage Lakes Drive
Akron, Ohio 44319
Phone: (330) 644-2293

Mr. Greg Schneider, Group Manager
Natural Heritage Program
Division of Natural Areas & Preserves
1889 Fountain Sq. Ct., Bldg. F-1
Columbus OH 43224-1388
Phone: 614-265-6452

Mr. Kevin Brown, State Conservationist
Natural Resource Conservation Service - Ohio State Office
200 North High Street, Room 522
Columbus, OH 43215
Telephone: (614) 255-2472

USDA-Natural Resource Conservation Service
Ravenna Service Center - Area Office
6970 State Route 88
Ravenna, OH 44266-9130

John Knapp, District Conservationist
Trumbull Soil and Water Conservation District
520 W. Main Street, Suite 3
Cortland, Ohio 44410

James Bierlair - District Coordinator
Portage Soil and Water Conservation District
6970 State Route 88
Ravenna OH 44266

Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049
Phone: (614) 644-3020

Ms. Claudia James, Community Planner
Portage County Regional Planning Commission
124 North Prospect
Ravenna, OH 44266

Ms. Christine Craycroft, Executive Director
Portage Park District
449 S. Meridian Street
Ravenna, OH 44266

Ms. Rachel M. Tooker
Ohio Historic Preservation Office
567 E Hudson Street
Columbus, OH 43221

RSVP LIST

Invitees	Agency	Yes	No
Tim Patronski	USFWS		X
Reynoldsburg Office	USFWS	X	
Ms. Claudia James	Portage County Regional Planning Commission	X	
Ms. Christine Craycroft	Portage Park District	X	
Dan Kramer	ODOW	X	
Mr. Jerrod Allison	ODOW		X
Mr. Jarod Roof	ODOW		X
Rick Gardner	Division of Natural Areas and Preserves	X	
Mr. Greg Schneider	Division of Natural Areas and Preserves		X
Randall E Sanders	Division of Real Estate and Land Management		X
James Bierlair	Portage Soil and Water Conservation District	X	
Ms. Rachel M. Tooker			
Dr.Mary Knapp			
Mr. Kevin Brown			
Mr. Samuel W. Speck			
John Knapp			

3 October 2005

Ohio Army National Guard
Ravenna Training and Logistics Site
ATTN: Tim Morgan, Environmental Supervisor
1438 State Route 534 SW
Newton Falls, OH 44444

Re: Draft Intergovernmental and Interagency Kick-off Meeting Summary: Ravenna Training and Logistics Site (RTLS), Newton Falls, OH; 22 September 2005
Integrated Natural Resources Management Plan for RTLS, Ohio Army National Guard
Contract No.: GS-10F-0230J, Order No. W91364-F-0151

Dear Mr. Morgan,

In accordance with the above-referenced Contract Number, AMEC participated in an Intergovernmental and Interagency Kick-Off Meeting at the RTLS, Newton Falls, Ohio on 22 September 2005. The purpose of this meeting was to discuss the Integrated Natural Resources Management Plan (INRMP) process and listen to concerns and ideas of agency attendees regarding the natural resources at the RTLS and the management of these resources. The following sections provide summaries of issues discussed at the meeting.

The kick-off meeting occurred from approximately 1030 to 1230 at the RTLS. The meeting included representatives from the Ohio Army National Guard (OHARNG), the Ohio Department of Natural Resources (ODNR), ODNR Division of Wildlife (DOW), ODNR Division of Forestry (DOF); the Portage County Stormwater Control, The Portage County Park District, the Portage County Regional Planning Commission, and AMEC. An attendance list for the meeting is provided in **Table 1**. The meeting was informal.

Table 1. Meeting Attendance Roster
RTLS INRMP Interagency and Intergovernmental Kick-Off Meeting
22 September 2005

Name	Affiliation	Phone Number	Email
LTC Thomas A. Tadsen	AGOH-RTLS	614-336-6790	tom.tadsen@oh.ngb.army.mil
MAJ Ed Meade	AGOH-RTLS	614-336-6560	william.meade1@oh.ngb.army.mil
Kim Ludt	RTLS-EN (FM)	614-336-6569	kimberly.ludt@oh.ngb.army.mil
Tim Morgan	RTLS-EN	614 336-6568	timothy.morgan@oh.ngb.army.mil
Rick Gardner	ODNR	614-265-6419	Rick.gardner@dnr.state.oh.us
Dan Kramer	ODNR Wildlife	330-644-2293	Dan.kramer@dnr.state.oh.us
James Bierlair	Portage SWCD	330-297-7633	
Christine Craycroft	Portage Park Dist.	330-297-7728	ccraycroft@portageparkdistrict.org
Claudia James	Portage County Regional Planning	330-297-3613	cjames@pcrpc.org
Mark Ervin	ODNR Forestry	614-265-6667	Mark.ervin@dnr.state.oh.us
Jennifer Pyzoha	AMEC	614-430-0487	jennifer.pyzoha@amec.com
Rebecca Sabraoui	AMEC	502-643-5475	rebecca.sabraoui@amec.com

Following introductions, the OHARNG and AMEC made an informal presentation outlining the INRMP process and providing an overview of the RTLS. The presentation is attached. Informal discussion among attendees ensued throughout the meeting. Summaries of the topics discussed follow:

AMEC Earth & Environmental, Inc.W:\OHARNG\RTLS\INRMP_321060112\Correspondance\05 RTLS INRMP Agency MtgSum 0922.doc
659 High Street, Suite 201
Worthington, Ohio 43085
phone: (614) 430-0487
fax (614) 430-0488
www.amec.com

Presentation
The presentation included the RTLS location, history, and existing land use; outlined the INRMP process; summarized the RTLS federal, state, and community roles and training requirements; and discussed potential natural resource management issues at the RTLS.

DoD policy requires installations to develop an INRMP, which is the primary tool for managing natural resources at these sites. The enforcement of natural resource law and regulations is a priority of the OHARNG, however it was stressed that natural resource management should not result in a net loss in the capability to support the military mission.

Training with Potential to Impact Natural Resources
- Increased minefield training
- Field fortifications
- Increased off-road maneuvers in the future

New tracked vehicle maneuver areas are managed on a rest-rotation basis.

Increased training activity will put more pressure on streams.

Measures Implemented to Avoid Impacts to Community and Natural Resources
- Established two Bailey Bridges
- Eliminated downwind dust by hardening roads/trails on site.

Natural Resource Management Issues
Natural resource management issues of particular focus include forestry management, wildlife management, and maintaining water quality. Wildlife management issues include deer herd, threatened and endangered species, and terrestrial and aquatic habitat management.

Forest Management: Ten forest compartments on the RTLS. Management of these compartments is conducted on a rotational basis. A 10 year forest schedule is located in the 2001 INRMP. This schedule will be reiterated in the revised INRMP.

The goal of forest management at the RTLS is maintain a balance between closed canopy forest and diversity. The overall management strategy includes:

- Small parcels – managed for more disturbance to favor shade-intolerant species
- Medium parcels – managed for relatively less disturbance
- Large parcels – little to no disturbance (safety and tree health issues only)

Monitoring for the emerald ash borer has been conducted the past two years.

Funds for forest management comes from DoD forestry account and firewood, timber and wood chip sales. Income from timber sales in 2004-2005 was $360K. Salvage firewood and wood chips were sold at $1/bundle (sold $300 worth). When all forest management activities have been conducted for the year and funds are still available, the excess funds are given to the county for roads.

Non-forested areas: New Mark-19 range to be built. Will manage it as grassland because trees can not be allowed to grow. Planning the first burn of this area in October. Burning and mowing of shrub and grassland habitat is hard to keep up with due to a lack of resources and time. These areas are reverting from shrub to forest habitat.

Wildlife Management: No major wildlife management actions are planned. Feral cats are the biggest nuisance species on site because they reduce bird populations. However, coyotes on site have been keeping feral cat levels down. Beaver control is done only when they flood roads, buildings or training areas. When this occurs, a local trapper (Keith Landes) is contracted to trap beavers in the localized problem areas. Groundhogs are no longer a problem. The deer herd is probably the biggest wildlife management issue at the RTLS. Fortunately the deer herd is currently at a healthy level. It is currently at a 1:1 or 1:2 ratio. Browse line tree destruction is not an issue at RTLS. In the past, the ratio has been as great as 1:7, thus this situation needs to be monitored regularly. A turkey hunt is conducted for local children.

Water Quality Management: At present, OHARNG does not have resources to manage the surface waters at the RTLS. Two of the streams have reference quality warm water stream habitats. The OHARNG will be working with the NRCS to protect the three major streams, which include Hinkley Creek, South Fork Eagle Creek, and Sand Creek. Riparian buffers are maintained in accordance with best management practices. Surface water quality has not been a big problem because only a small portion of the RTLS is unpaved and minimal off-road training activities have occurred. However, maintaining headwaters and water quality will be something to focus on in future years.

Some of the ponds need work done on them. Dams have been blown out. They plan to fix some of the major problems associated with the breached dams, but very little aquatic management occurs at the RTLS because of a lack of resources.

EPA wants more ground water monitoring.

Potable water comes from Newton Falls. On-site wells are not used for potable water.

The RTLS is within the U.S. Army Corps of Engineers Pittsburgh District.

Planning level surveys:

- Breeding bird surveys conducted annually (potential nesting pair of sandhill crane spotted this year)
- Indicator species every five years (includes herptiles, Lepidoptera and Indiana bat)
- Plants, mollusks every ten years

Environmental remediation:

Siting of buildings always gets environmental review
Public access always an issue with respect to training

The Installation Restoration Program (Army and BRAC) is working on 1300 acres with areas of concern. Environmental restoration is based on risk assessment that considers end use.

Discussion

Community Partnership - The RTLS staff have partnered with Windham High School to do stream sampling for several years. This will likely continue and is a good example of partnering.

The OHARNG is looking for ways to partner with local agencies in natural resource planning and management where possible. Input is sought from county agencies with respect to the county's long-term planning issues. The OHARNG wants to make its management strategy consistent with long-term regional planning.

Discussion on the possibility of obtaining an easement (outside the fence) from RTLS for a trail (Tim will provide a location map for the proposed trail easement). Portage County Parks has plans for a cross-county east-west multi-purpose regional connector trail that will meet up with the existing Summit County trail. The OHARNG suggested that Portage County submit a proposal to LTC Tadsen, and that the possibility of funding under the Civil-Military Integrated Readiness Training (CMIRT) program would be investigated. Once proposal is approved through the OHARNG, LTC Tadsen suggested the Portage County Parks Department should simultaneously apply for the easement and request this as a CIMERT project.

The RTLS does not want to encourage encroachment (adjacent development). The RTLS does not qualify for Army funding to establish buffer. Potential partners suggested include The Nature Conservancy, and Portage County Parks. Some discussion was held about whether agricultural easements could be used to create a buffer from development.

The U.S. Forest Service (USFS) Forest Legacy Program was mentioned as a possibility for establishing forest buffers outside the RTLS boundary. The Forest Legacy Program is highly competitive on a national level; however projects that benefit other federal agencies, land or investments are given higher priority. Applications are due in January to the Ohio DNR, and are forwarded to USFS. Both Portage and Trumbull Counties are included in the program areas. The areas must be privately owned and managed under an approved forest management plan. See their website for additional information:
http://www.fs.fed.us/spf/coop/programs/loa/flp.shtml.

Some discussion ensued as to whether the RTLS would be a good place to do forestry and/or fire training. The RTLS and the ODOF have discussed this in the past. The OHARNG would supply the land and trees for the timber or prescribed burn training, but would like the ODOF to provide them with free training/certification for any RTLS personnel interested.

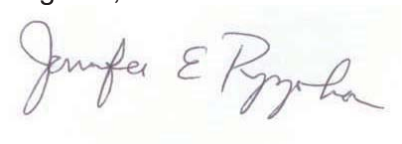
Kim Ludt offers up one or two Saturdays a year for bird sight-seeing tours at the RTLS. She would like to keep it at maximum of two Saturdays per year. The Portage County Parks department expressed interest in participating in these bird tours. If there is interest, Kim would be willing to conduct additional bird tours during regular weekday business hours.

Next Agency Review

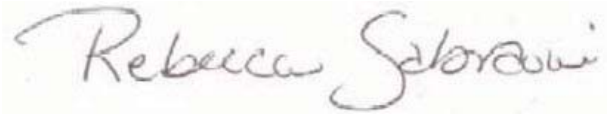
The local and state agencies attending the meeting, as well as the U.S. Fish and Wildlife Service, will be offered an opportunity to review the draft INRMP revision. The draft INRMP should be available in late spring 2006.

Should you have any questions, or if this summary does not match your recollections, please feel free to contact me at 614-430-0487.

Regards,



Jennifer E. Pyzoha
Environmental Planner



Rebecca Sabraoui, AICP
Project Manager

Enclosure

cc: Attendees

/cf

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6950 Americana Parkway, Suite H
Reynoldsburg, Ohio 43068-4127

(614) 469-6923/Fax: (614) 469-6919

August 25, 2005

Ms. Jennifer Pyzoha
AMEC Earth and Environmental, Inc.
659 High Steer, Suite 201
Worthington, Ohio 43085

Re: INRMP Revision for Ravenna Training and Logistics Site

Dear Ms. Pyzoha:

This is in response to your August 3, 2005 letter requesting information we may have regarding the occurrence or possible occurrence of Federally-listed threatened or endangered species within the vicinity of the 21,419 acres of the Ravenna Training and Logistics Site (RTLS) located in Portage and Trumbull Counties, Ohio. This information will be used as part of the revision process for the Integrated Natural Resource Management Plan (INRMP). Although our office has no new records of listed species, the Service is providing general guidelines regarding species potentially present in the project area. There are no Federal wildlife refuges, wilderness areas, or Critical Habitat within the vicinity of this site.

ENDANGERED SPECIES COMMENTS: The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a Federally-listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. Summer habitat requirements for the species are not well defined but the following are considered important:

1. Dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas.

2. Live trees (such as shagbark hickory and oaks) which have exfoliating bark.

3. Stream corridors, riparian areas, and upland woodlots which provide forage sites.

Should the proposed site contain trees or associated habitats exhibiting any of the characteristics listed above, we recommend that the habitat and surrounding trees be saved wherever possible. If the trees must be cut, further coordination with this office is requested to determine if surveys are warranted. Any survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office.

The proposed project lies within the range of the **Mitchell's satyr butterfly** (*Neonympha mitchellii*), a federal endangered species. The favored habitat for this species is sedge-dominated fens with low shrubs and tamaracks. If appropriate habitat is found on the site, we recommend surveying for the butterfly between June and August, during its most active period.

The project lies within the range of the **eastern massasauga** *(Sistrurus catenatus catenatus)*, a docile rattlesnake that is declining throughout its national range and is currently a Federal Candidate species. The snake is currently listed as endangered by the State of Ohio. Your proactive efforts to conserve this species now may help avoid the need to list the species under the Endangered Species Act in the future. Due to their reclusive nature, we encourage early project coordination to avoid potential impacts to massasaugas and their habitat. At a minimum, project evaluations should contain delineations of whether or not massasauga habitat occurs within project boundaries.

The massasauga is often found in or near wet areas, including wetlands, wet prairie, or nearby woodland or shrub edge habitat. This often includes dry goldenrod meadows with a mosaic of early successional woody species such as dogwood or multiflora rose. Wet habitat and nearby dry edges are utilized by the snakes, especially during the spring and fall. Dry upland areas up to 1.5 miles away are utilized during the summer, if available. For additional information on the eastern massasauga, including project management ideas, please visit the following website: http://www.fws.gov/midwest/Endangered/lists/candidat.html#massasauga or contact this office directly.

The proposed project lies within the range of the **clubshell mussel** *(Pleurobema clava)*, a Federally-listed endangered species, the **bald eagle** *(Haliaeetus leucocephalus)*, and the **northern monkshood** *(Aconitum noveboracense)*, both Federally-listed threatened species. Due to the project location, the presence of clubshell mussel is not likely; no impacts to this species are anticipated. There are no known bald eagle nests within a half mile of the project area; no impacts to bald eagles are anticipated. The site does not appear to contain shaded cliff faces in wooded ravines, or other suitable habitat for the northern monkshood; therefore no impacts to this species are anticipated. Relative to these species, this precludes the need for further action on this project as required by the 1973 Endangered Species Act, as amended. Should, during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be reinitiated to assess whether the determinations are still valid.

This technical assistance letter is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C.661 et seq.), the Endangered Species Act of 1973, as amended, and is consistent with the intent of the National Environmental Policy Act of 1969, and the U.S. Fish and Wildlife Service's Mitigation Policy.

If you have any questions regarding our response or if you need additional information, please contact Karyn Tremper at extension 13.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Field Supervisor

cc: ODNR, DOW, SCEA Unit, Columbus, OH

United States Department of Agriculture

NRCS
Natural Resources Conservation Service
200 North High Street, Room 522
Columbus, Ohio 43215-2478
(614) 255-2472 Fax (614) 255-2549

August 24, 2005

Ms. Jennifer Pyzoha
AMEC Earth & Environmental, Inc.
659 High Street, Suite 201
Worthington, Ohio 43085

Dear Ms. Pyzoha:

In response to a request for environmental information related to the Ravenna Training and Logistics Site, I am providing the following information:

- Prime and Other Important Farmlands of Portage County, Ohio
- Hydric Soils of Portage County, Ohio
- Prime and Other Important Farmlands of Trumbull County, Ohio
- Hydric Soils of Trumbull County, Ohio

I am also including a copy of the Soil Surveys for Trumbull and Portage Counties.

Digital soils data is available for Trumbull County at the following url:

http://soildatamart.nrcs.usda.gov/Survey.aspx?State=OH

Digital soils data will also be available for Portage County at this site once the digitizing project is completed.

This is the extent of the information we have available from the requested list.

Sincerely,

Michelle A. Johnson

TERRY J. COSBY
for State Conservationist

Enclosures

Prime and other Important Farmlands

Portage County, Ohio

Map symbol	Map unit name	Farmland classification
BgA	Bogart silt loam, 0 to 2 percent slopes	All areas are prime farmland
BgB	Bogart silt loam, 2 to 6 percent slopes	All areas are prime farmland
BhB	Bogart-Haskins complex, 2 to 6 percent slopes	All areas are prime farmland
CdA	Canfield silt loam, 0 to 2 percent slopes	All areas are prime farmland
CdB	Canfield silt loam, 2 to 6 percent slopes	All areas are prime farmland
CnA	Chili loam, 0 to 2 percent slopes	All areas are prime farmland
CnB	Chili loam, 2 to 6 percent slopes	All areas are prime farmland
CpA	Chili silt loam, 0 to 2 percent slopes	All areas are prime farmland
CpB	Chili silt loam, 2 to 6 percent slopes	All areas are prime farmland
ElB	Ellsworth silt loam, 2 to 6 percent slopes	All areas are prime farmland
ElB2	Ellsworth silt loam, 2 to 6 percent slopes, moderately eroded	All areas are prime farmland
EsB	Ellsworth silt loam, sandstone substratum, 2 to 6 percent slopes	All areas are prime farmland
GfA	Glenford silt loam, 0 to 2 percent slopes	All areas are prime farmland
GfB	Glenford silt loam, 2 to 6 percent slopes	All areas are prime farmland
LoB	Loudonville silt loam, 2 to 6 percent slopes	All areas are prime farmland
MvB	Mitiwanga silt loam, moderately well drained variant, 2 to 6 percent slopes	All areas are prime farmland
OsB	Oshtemo sandy loam, 2 to 6 percent slopes	All areas are prime farmland
RsB	Rittman silt loam, 2 to 6 percent slopes	All areas are prime farmland
Tg	Tioga loam	All areas are prime farmland
WhA	Wheeling silt loam, 0 to 2 percent slopes	All areas are prime farmland
WhB	Wheeling silt loam, 2 to 6 percent slopes	All areas are prime farmland
WuB	Wooster silt loam, 2 to 6 percent slopes	All areas are prime farmland
Ca	Canadice silt loam	Farmland of local importance
CcA	Caneadea silt loam, 0 to 2 percent slopes	Farmland of local importance
CcB	Caneadea silt loam, 2 to 6 percent slopes	Farmland of local importance
CdC	Canfield silt loam, 6 to 12 percent slopes	Farmland of local importance
CdC2	Canfield silt loam, 6 to 12 percent slopes, moderately eroded	Farmland of local importance
CnC	Chili loam, 6 to 12 percent slopes	Farmland of local importance
CoC2	Chili gravelly loam, 6 to 12 percent slopes, moderately eroded	Farmland of local importance
CpC	Chili silt loam, 6 to 12 percent slopes	Farmland of local importance
CtD	Chili-Oshtemo complex, 12 to 18 percent slopes	Farmland of local importance
CwC2	Chili-Wooster complex, 6 to 12 percent slopes, moderately eroded	Farmland of local importance
ElC	Ellsworth silt loam, 6 to 12 percent slopes	Farmland of local importance
ElC2	Ellsworth silt loam, 6 to 12 percent slopes, moderately eroded	Farmland of local importance
GbB	Geeburg silt loam, 2 to 6 percent slopes	Farmland of local importance
GbB2	Geeburg silt loam, 2 to 6 percent slopes, moderately eroded	Farmland of local importance
GbC2	Geeburg silt loam, 6 to 12 percent slopes, moderately eroded	Farmland of local importance
GfC2	Glenford silt loam, 6 to 12 percent slopes, moderately eroded	Farmland of local importance
LaB	Lakin loamy sand, 2 to 6 percent slopes	Farmland of local importance
LaC	Lakin loamy sand, 6 to 12 percent slopes	Farmland of local importance
LoC	Loudonville silt loam, 6 to 12 percent slopes	Farmland of local importance
LoC2	Loudonville silt loam, 6 to 12 percent slopes, moderately eroded	Farmland of local importance
OsC	Oshtemo sandy loam, 6 to 12 percent slopes	Farmland of local importance
RmA	Remsen silt loam, 0 to 2 percent slopes	Farmland of local importance
RmB	Remsen silt loam, 2 to 6 percent slopes	Farmland of local importance
RsC	Rittman silt loam, 6 to 12 percent slopes	Farmland of local importance
RsC2	Rittman silt loam, 6 to 12 percent slopes, moderately eroded	Farmland of local importance
TrA	Trumbull silt loam, 0 to 2 percent slopes	Farmland of local importance
WuC	Wooster silt loam, 6 to 12 percent slopes	Farmland of local importance

Prime and other Important Farmlands

Portage County, Ohio

Map symbol	Map unit name	Farmland classification
WuC2	Wooster silt loam, 6 to 12 percent slopes, moderately eroded	Farmland of local importance
Da	Damascus loam	Prime farmland if drained
FcA	Fitchville silt loam, 0 to 2 percent slopes	Prime farmland if drained
FcB	Fitchville silt loam, 2 to 6 percent slopes	Prime farmland if drained
Fr	Frenchtown silt loam	Prime farmland if drained
HaB	Haskins loam, 2 to 6 percent slopes	Prime farmland if drained
HrB	Hornell silt loam, 3 to 8 percent slopes	Prime farmland if drained
JtA	Jimtown loam, 0 to 2 percent slopes	Prime farmland if drained
JtB	Jimtown loam, 2 to 6 percent slopes	Prime farmland if drained
Ln	Lorain silty clay loam	Prime farmland if drained
MgA	Mahoning silt loam, 0 to 2 percent slopes	Prime farmland if drained
MgB	Mahoning silt loam, 2 to 6 percent slopes	Prime farmland if drained
MtA	Mitiwanga silt loam, 0 to 2 percent slopes	Prime farmland if drained
MtB	Mitiwanga silt loam, 2 to 6 percent slopes	Prime farmland if drained
Od	Olmsted loam	Prime farmland if drained
Or	Orrville silt loam	Prime farmland if drained
ReA	Ravenna silt loam, 0 to 2 percent slopes	Prime farmland if drained
ReB	Ravenna silt loam, 2 to 6 percent slopes	Prime farmland if drained
Sb	Sebring silt loam	Prime farmland if drained
Sv	Sebring silt loam, dark surface variant	Prime farmland if drained
WaA	Wadsworth silt loam, 0 to 2 percent slopes	Prime farmland if drained
WaB	Wadsworth silt loam, 2 to 6 percent slopes	Prime farmland if drained
Ho	Holly silt loam	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Hydric Soils

Portage County, Ohio

[This report lists only those map unit components that are rated as hydric. Dashes (---) in any column indicate that the data were not included in the database. Definitions of hydric criteria codes are included at the end of the report]

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
Ca: Canadice silt loam	Canadice	100	Depression	Yes	2B3
CcA: Caneadea silt loam, 0 to 2 percent slopes	Canadice	10	Depression	Yes	2B3
CcB: Caneadea silt loam, 2 to 6 percent slopes	Canadice	10	Depression	Yes	2B3
Cg: Carlisle muck	Carlisle	100	Marsh	Yes	1
Da: Damascus loam	Damascus	100	Flat	Yes	2B3
DkD: Dekalb channery loam 12 to 25 percent slopes	poorly drained soils	5	Hill	Yes	2B3
DkF: Dekalb channery loam, 25 to 70 percent slopes	poorly drained soils	5	Hill	Yes	2B3
FcA: Fitchville silt loam, 0 to 2 percent slopes	Sebring	10	Depression	Yes	2B3
FcB: Fitchville silt loam, 2 to 6 percent slopes	Sebring	10	Depression	Yes	2B3
FnA: Fitchville-Urban land complex, nearly level	Sebring	10	Depression	Yes	2B3
Fr: Frenchtown silt loam	Frenchtown	100	Flat	Yes	2B3
Ho: Holly silt loam	Holly	95	Flood plain	Yes	2B3, 4
JtA: Jimtown loam, 0 to 2 percent slopes	Damascus	10	Depression	Yes	2B3
Ld: Linwood muck	Linwood	100	Depression	Yes	1, 3
Ln: Lorain silty clay loam	Lorain	100	Depression	Yes	2B3

Hydric Soils

Portage County, Ohio

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
MgA: Mahoning silt loam, 0 to 2 percent slopes	Trumbull	10	Depression	Yes	2B3
MnB: Mahoning-Urban land complex, undulating	Trumbull	10	Depression	Yes	2B3
Od: Olmsted loam	Olmsted	100	Flat	Yes	2B3, 3
Or: Orrville silt loam	Holly	10	Depression	Yes	2B3, 4
ReA: Ravenna silt loam, 0 to 2 percent slopes	Frenchtown	10	Depression	Yes	2B3
RmA: Remsen silt loam, 0 to 2 percent slopes	Trumbull	10	Depression	Yes	2B3
RsC2: Rittman silt loam, 6 to 12 percent slopes, moderately eroded	wet spots	5	Drainageway	Yes	2B3
Sb: Sebring silt loam	Sebring	100	Terrace	Yes	2B3
Sv: Sebring silt loam, dark surface variant	Sebring variant	100	Glacial lake (relict)	Yes	2B3
TrA: Trumbull silt loam, 0 to 2 percent slopes	Trumbull	100	Depression	Yes	2B3
WaA: Wadsworth silt loam, 0 to 2 percent slopes	Frenchtown	10	Depression	Yes	2B3
WaB: Wadsworth silt loam, 2 to 6 percent slopes	Frenchtown	5	Drainageway	Yes	2B3
Wc: Wallkill silt loam	Wallkill	100	Depression	Yes	2B3, 3, 4

Explanation of hydric criteria codes:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or

B. are poorly drained or very poorly drained and have either:
   1.) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
   2.) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
   3.) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

Prime and other Important Farmlands

Trumbull County, Ohio

Map symbol	Map unit name	Farmland classification
CaB	Cambridge silt loam, 2 to 6 percent slopes	All areas are prime farmland
CfB	Canfield silt loam, 2 to 6 percent slopes	All areas are prime farmland
CkB	Chenango gravelly loam, 2 to 6 percent slopes	All areas are prime farmland
CnA	Chili loam, 0 to 2 percent slopes	All areas are prime farmland
CnB	Chili loam, 2 to 6 percent slopes	All areas are prime farmland
EhB	Ellsworth silt loam, 2 to 6 percent slopes	All areas are prime farmland
EhB2	Ellsworth silt loam, 2 to 6 percent slopes, eroded	All areas are prime farmland
GfB	Glenford silt loam, 2 to 6 percent slopes	All areas are prime farmland
LrB	Lordstown loam, 2 to 6 percent slopes	All areas are prime farmland
LyB	Loudonville silt loam, 2 to 6 percent slopes	All areas are prime farmland
OsB	Oshtemo sandy loam, 2 to 6 percent slopes	All areas are prime farmland
RdB	Rawson silt loam, 2 to 6 percent slopes	All areas are prime farmland
RsB	Rittman silt loam, 2 to 6 percent slopes	All areas are prime farmland
SeB	Seward loamy fine sand, 2 to 6 percent slopes	All areas are prime farmland
Tg	Tioga loam, occasionally flooded	All areas are prime farmland
CaC	Cambridge silt loam, 6 to 12 percent slopes	Farmland of local importance
Cb	Canadice silty clay loam	Farmland of local importance
CcA	Caneadea silty loam, 0 to 2 percent slopes	Farmland of local importance
CcB	Caneadea silt loam, 2 to 6 percent slopes	Farmland of local importance
CdA	Caneadea-Canadice complex, 0 to 2 percent slopes	Farmland of local importance
CfC	Canfield silt loam, 6 to 12 percent slopes	Farmland of local importance
CnC	Chili loam, 6 to 12 percent slopes	Farmland of local importance
EhC2	Ellsworth silt loam, 6 to 12 percent slopes, eroded	Farmland of local importance
EyB	Elnora loamy fine sand, 2 to 6 percent slopes	Farmland of local importance
GbB	Geeburg silt loam, 2 to 6 percent slopes	Farmland of local importance
GbB2	Geeburg silt loam, 2 to 6 percent slopes, eroded	Farmland of local importance
GbC	Geeburg silt loam, 6 to 12 percent slopes	Farmland of local importance
GbC2	Geeburg silt loam, 6 to 12 percent slopes, eroded	Farmland of local importance
GfC	Glenford silt loam, 6 to 12 percent slopes	Farmland of local importance
LaB	Lakin loamy fine sand, 2 to 8 percent slopes	Farmland of local importance
LrC	Lordstown loam, 6 to 12 percent slopes	Farmland of local importance
LyC	Loudonville silt loam, 6 to 12 percent slopes	Farmland of local importance
LyC2	Loudonville silt loam, 6 to 12 percent slopes, eroded	Farmland of local importance
MhC	Mahoning silt loam, shale substratum, 6 to 12 percent slopes	Farmland of local importance
OsC	Oshtemo sandy loam, 6 to 12 percent slopes	Farmland of local importance
PeC2	Pierpont silt loam, 6 to 12 percent slopes, eroded	Farmland of local importance
PsA	Platea silt loam, 0 to 2 percent slopes	Farmland of local importance
PsB	Platea silt loam, 2 to 6 percent slopes	Farmland of local importance
PsC	Platea silt loam, 6 to 12 percent slopes	Farmland of local importance
RmA	Remsen silt loam, 0 to 2 percent slopes	Farmland of local importance
RmB	Remsen silt loam, 2 to 6 percent slopes	Farmland of local importance
RsC	Rittman silt loam, 6 to 12 percent slopes	Farmland of local importance
Tr	Trumbull silty clay loam	Farmland of local importance
CkC	Chenango gravelly loam, 6 to 12 percent slopes	Farmland of unique importance
DrC	Darien silt loam, 6 to 12 percent slopes	Farmland of unique importance
Ct	Condit silt loam	Prime farmland if drained
Da	Damascus loam	Prime farmland if drained
DrA	Darien silt loam, 0 to 2 percent slopes	Prime farmland if drained
DrB	Darien silt loam, 2 to 6 percent slopes	Prime farmland if drained

Prime and other Important Farmlands

Trumbull County, Ohio

Map symbol	Map unit name	Farmland classification
FcA	Fitchville silt loam, 0 to 2 percent slopes	Prime farmland if drained
FcB	Fitchville silt loam, 2 to 6 percent slopes	Prime farmland if drained
HaA	Haskins loam, 0 to 2 percent slopes	Prime farmland if drained
HaB	Haskins loam, 2 to 6 percent slopes	Prime farmland if drained
JtA	Jimtown loam, 0 to 2 percent slopes	Prime farmland if drained
JtB	Jimtown loam, 2 to 6 percent slopes	Prime farmland if drained
Lo	Lorain silty clay loam	Prime farmland if drained
Lp	Lorain silty clay loam, loamy substratum	Prime farmland if drained
MgA	Mahoning silt loam, 0 to 2 percent slopes	Prime farmland if drained
MgB	Mahoning silt loam, 2 to 6 percent slopes	Prime farmland if drained
MhA	Mahoning silt loam, shale substratum, 0 to 2 percent slopes	Prime farmland if drained
MhB	Mahoning silt loam, shale substratum, 2 to 6 percent slopes	Prime farmland if drained
Mo	Mill silt loam, 0 to 2 percent slopes	Prime farmland if drained
MtA	Mitiwanga silt loam, 0 to 2 percent slopes	Prime farmland if drained
MtB	Mitiwanga silt loam, 2 to 6 percent slopes	Prime farmland if drained
RaA	Ravenna silt loam, 0 to 2 percent slopes	Prime farmland if drained
RaB	Ravenna silt loam, 2 to 6 percent slopes	Prime farmland if drained
RhA	Red Hook silt loam, 0 to 2 percent slopes	Prime farmland if drained
Sb	Sebring silt loam	Prime farmland if drained
Sc	Sebring silt loam, till substratum	Prime farmland if drained
VeA	Venango silt loam, 0 to 2 percent slopes	Prime farmland if drained
VeB	Venango silt loam, 2 to 6 percent slopes	Prime farmland if drained
WbA	Wadsworth silt loam, 0 to 2 percent slopes	Prime farmland if drained
WbB	Wadsworth silt loam, 2 to 6 percent slopes	Prime farmland if drained
Ho	Holly silt loam, frequently flooded	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Or	Orrville silt loam, frequently flooded	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Ot	Otego silt loam, 0 to 2 percent slopes, frequently flooded	Prime farmland if protected from flooding or not frequently flooded during the growing season
Th	Tioga loam, frequently flooded	Prime farmland if protected from flooding or not frequently flooded during the growing season

Hydric Soils

Trumbull County, Ohio

[This report lists only those map unit components that are rated as hydric. Dashes (---) in any column indicate that the data were not included in the database. Definitions of hydric criteria codes are included at the end of the report]

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
BrF:					
Brecksville silt loam, 25 to 50 percent slopes	Holly	2	---	Yes	2B3, 4
Cb:					
Canadice silty clay loam	Canadice	85	---	Yes	2B3, 3
	Sebring	3	---	Yes	2B3, 3
CcA:					
Caneadea silty loam, 0 to 2 percent slopes	Canadice	8	---	Yes	2B3, 3
	Sebring	7	---	Yes	2B3, 3
CcB:					
Caneadea silt loam, 2 to 6 percent slopes	Canadice	15	---	Yes	2B3, 3
CdA:					
Caneadea-Canadice complex, 0 to 2 percent slopes	Canadice	35	---	Yes	2B3, 3
	Sebring	10	---	Yes	2B3, 3
CeA:					
Caneadea-Urban land complex, 0 to 2 percent slopes	Canadice	8	---	Yes	2B3, 3
	Lorain	7	---	Yes	2B3, 3
Ch:					
Carlisle muck, ponded	Carlisle	85	---	Yes	1, 3
	Canadice	8	---	Yes	2B3, 3
	Sebring	7	---	Yes	2B3, 3
Ct:					
Condit silt loam	Condit	85	---	Yes	2B3, 3
Da:					
Damascus loam	Damascus	85	---	Yes	2B3, 3
DrA:					
Darien silt loam, 0 to 2 percent slopes	Condit	8	---	Yes	2B3, 3
	Sebring	7	---	Yes	2B3, 3

Hydric Soils

Trumbull County, Ohio

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
DrB:					
Darien silt loam, 2 to 6 percent slopes	Condit	8	---	Yes	2B3, 3
	Sebring	7	---	Yes	2B3, 3
EhB2:					
Ellsworth silt loam, 2 to 6 percent slopes, eroded	Condit	5	---	Yes	2B3, 3
FcA:					
Fitchville silt loam, 0 to 2 percent slopes	GLENFORD	8	---	Yes	2B3, 3
	Sebring	7	---	Yes	2B3, 3
FcB:					
Fitchville silt loam, 2 to 6 percent slopes	GLENFORD	5	---	Yes	2B3, 3
	Sebring	5	---	Yes	2B3, 3
FdA:					
Fitchville-Urban land complex, 0 to 3 percent slopes	Sebring	7	---	Yes	2B3, 3
GbC2:					
Geeburg silt loam, 6 to 12 percent slopes, eroded	Holly	5	---	Yes	2B3, 3
GnB:					
Glenford-Urban land complex, 2 to 6 percent slopes	FITCHVILLE	5	---	Yes	2B3, 3
	Sebring	5	---	Yes	2B3, 3
HaA:					
Haskins loam, 0 to 2 percent slopes	Damascus	5	---	Yes	2B3, 3
	Sebring	5	---	Yes	2B3, 3
HbB:					
Haskins-Urban land complex, 2 to 6 percent slopes	Sebring	8	---	Yes	2B3, 3
Ho:					
Holly silt loam, frequently flooded	Holly	85	---	Yes	2B3, 3
JtA:					
Jimtown loam, 0 to 2 percent slopes	Damascus	15	---	Yes	2B3, 3

Hydric Soils

Trumbull County, Ohio

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
JtB:					
Jimtown loam, 2 to 6 percent slopes	Damascus	5	---	Yes	2B3, 3
	HASKINS	5	---	Yes	2B3, 3
JuA:					
Jimtown-Urban land complex, 0 to 3 percent slopes	Damascus	5	---	Yes	2B3, 3
Lo:					
Lorain silty clay loam	Lorain	85	---	Yes	2B3, 3
Lp:					
Lorain silty clay loam, loamy substratum	Lorain	85	---	Yes	2B3, 3
LxF:					
Lordstown-Rock outcrop complex, 18 to 50 percent slopes	Holly	7	---	Yes	2B3, 3
MgA:					
Mahoning silt loam, 0 to 2 percent slopes	Condit	5	---	Yes	2B3, 3
	Trumbull	5	---	Yes	2B3, 3
MgB:					
Mahoning silt loam, 2 to 6 percent slopes	Condit	5	---	Yes	2B3, 3
	Trumbull	5	---	Yes	2B3, 3
MhA:					
Mahoning silt loam, shale substratum, 0 to 2 percent slopes	Condit	10	---	Yes	2B3, 3
MhB:					
Mahoning silt loam, shale substratum, 2 to 6 percent slopes	Condit	10	---	Yes	2B3, 3
MhC:					
Mahoning silt loam, shale substratum, 6 to 12 percent slopes	Condit	8	---	Yes	2B3, 3
MkB:					
Mahoning-Urban land complex, 2 to 6 percent slopes	Condit	5	---	Yes	2B3, 3
Mo:					
Mill silt loam, 0 to 2 percent slopes	Mill	86	End moraine, Ground moraine	Yes	---

Hydric Soils

Trumbull County, Ohio

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
MtA:					
Mitiwanga silt loam, 0 to 2 percent slopes	Condit	8	---	Yes	2B3, 3
	Sebring	7	---	Yes	2B3, 3
MtB:					
Mitiwanga silt loam, 2 to 6 percent slopes	Condit	8	---	Yes	2B3, 3
	Sebring	7	---	Yes	2B3, 3
Or:					
Orrville silt loam, frequently flooded	TIOGA	8	---	Yes	2B3, 3
	Holly	7	---	Yes	2B3, 3
PsA:					
Platea silt loam, 0 to 2 percent slopes	Sebring	15	---	Yes	2B3, 3
PsB:					
Platea silt loam, 2 to 6 percent slopes	Sebring	15	---	Yes	2B3, 3
PsC:					
Platea silt loam, 6 to 12 percent slopes	Sebring	8	---	Yes	2B3, 3
	moderately well drained soils	7	---	Yes	2B3, 3
RaA:					
Ravenna silt loam, 0 to 2 percent slopes	Sebring	5	---	Yes	2B3, 3
RaB:					
Ravenna silt loam, 2 to 6 percent slopes	CANFIELD	5	---	Yes	2B3, 3
	Sebring	5	---	Yes	2B3, 3
RhA:					
Red Hook silt loam, 0 to 2 percent slopes	Poorly drained soils with more clay in the subsoil	10	Outwash plain, Outwash terrace	Yes	---
RmA:					
Remsen silt loam, 0 to 2 percent slopes	Trumbull	7	---	Yes	2B3, 3
RmB:					
Remsen silt loam, 2 to 6 percent slopes	Trumbull	7	---	Yes	2B3, 3

Hydric Soils

Trumbull County, Ohio

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
RoB:					
Remsen-Urban land complex, 2 to 6 percent slopes	GEEBURG	5	---	Yes	2B3, 3
	Trumbull	5	---	Yes	2B3, 3
Sb:					
Sebring silt loam	Sebring	85	---	Yes	2B3, 3
Sc:					
Sebring silt loam, till substratum	Sebring	85	---	Yes	2B3, 3
Tg:					
Tioga loam, occasionally flooded	Holly	5	---	Yes	2B3, 3
Th:					
Tioga loam, frequently flooded	Holly	5	---	Yes	2B3, 3
Tr:					
Trumbull silty clay loam	Trumbull	85	---	Yes	2B3, 3
VeA:					
Venango silt loam, 0 to 2 percent slopes	CAMBRIDGE	8	---	Yes	2B3, 3
	Sebring	7	---	Yes	2B3, 3
VeB:					
Venango silt loam, 2 to 6 percent slopes	Sebring	7	---	Yes	2B3, 3
WbA:					
Wadsworth silt loam, 0 to 2 percent slopes	Sebring	8	---	Yes	2B3, 3
WbB:					
Wadsworth silt loam, 2 to 6 percent slopes	Sebring	8	---	Yes	2B3, 3
WeA:					
Wadsworth-Urban land complex, 0 to 2 percent slopes	Sebring	5	---	Yes	2B3, 3
WeB:					
Wadsworth-Urban land complex, 2 to 6 percent slopes	Sebring	5	---	Yes	2B3, 3

Explanation of hydric criteria codes:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. are somewhat poorly drained and have a water table at the surface (0.0 feet)

during the growing season, or

B. are poorly drained or very poorly drained and have either:

1.) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or

2.) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or

3.) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.

3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

MEMORANDUM FOR RECORD

Native Americans contacted regarding RTLS INRMP (letters from TAG mailed on 12 August 2005)

Federally Recognized Tribe	POC	Title	Response	Comments
Absentee-Shawnee Tribe of Oklahoma	Ken Blanchard	Governor		
Absentee-Shawnee Tribe of Oklahoma	Karen Kaniatobe	THPO		
Bad River Band of the Lake Superior Tribe of Chippewas	Eugene Bigboy, Sr.	Chairman		
Bad River Band of the Lake Superior Tribe of Chippewas	Jeff Beirl	Tribal Operations		
Bay Mills Indian Community of Michigan	Jeffrey D. Parker	President		
Bay Mills Indian Community of Michigan	Ken Gabheart	NAGPRA Representative		
Bois Forte Reservation Business Committee	Gary W. Donald	Chairman		
Bois Forte Reservation Business Committee	THPO/NAGPRA Representative			
Cayuga Nation of Indians	Vernon Isaac	Chief		
Cayuga Nation of Indians	Clint Halftown	NAGPRA Representative		
Chippewa-Cree Business Committee	John Houle	Chairman		
Chippewa-Cree Business Committee	Janice Meyers	NAGPRA Representative		
Citizen Potawatomi Nation	John A. Barrett	Chairman		
Citizen Potawatomi Nation	Jeremy Finch	THPO		
Delaware Nation	Lawrence F. Snake	President		

Delaware Nation	Tamara Francis	NAGPRA Director	Letter 13 Sep 05	Interested in project
Delaware Tribe of Indians	Dr. Brice Obermeyer	NAGPRA Director		
Eastern Shawnee Tribe of Oklahoma	Charles D. Enyart	Chief		
Eastern Shawnee Tribe of Oklahoma	Jo Ann Beckham	Administrative Assistant	e-mail 6 Sept 05	No interest in project area unless NAGPRA items or human remains are discovered.
Fond du Lac Reservation Business Committee	Robert Peacock	Chairman		
Fond du Lac Reservation Business Committee	Ferdinand Martino	Cultural Resources Manager		
Forest County Potawatomi Community of Wisconsin	Harold Frank	Chairman		
Forest County Potawatomi Community of Wisconsin	Clarice Ritchie	NAGPRA Representative		
Grand Portage Reservation Business Committee	Norman DesChampe	Chairman		
Grand Portage Reservation Business Committee	Gilbert Caribou	Secretaty/Treasurer		
Grand Traverse Band of Ottawa & Chippewa Indians of Michigan	Robert Kewaygoshkum	Chairman		
Grand Traverse Band of Ottawa & Chippewa Indians of Michigan	Pearly Broome	Cultural Program Director		
Hannahville Indian Community of Michigan	Kenneth Meshigaud	Chairperson		
Hannahville Indian Community of Michigan	Earl Meshigaud	Cultural Director		
Keweenaw Bay Indian Community	Susan Lafernier	Chairman		

Keweenaw Bay Indian Community	Summer Cohen	THPO Coordinator	e-mail 30 Aug 05	No interest in project area unless artifacts or human remains are discovered.
Kickapoo Traditional Tribe of Texas	Raul Garza	Chairman		
Kickapoo Traditional Tribe of Texas	Isadora Garza	NAGPRA Representative		
Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas	Steve Cadue	Chairman		
Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas	Curtis Simon	NAGPRA Representative		
Kickapoo Tribe of Oklahoma	Danny Kaskaske	Chairman		
Kickapoo Tribe of Oklahoma	Kent Collier	NAGPRA Representative		
Lac Courte Oreilles Band of Lake Superior Chippewas	Gaiashkibos	Chairman		
Lac Courte Oreilles Band of Lake Superior Chippewas	Brian Bisinet	THPO		
Lac du Flambeau Band of Lake Superior Chippewa Indians of Wisconsin	Henry St. Germaine, Sr.	President		
Lac du Flambeau Band of Lake Superior Chippewa Indians of Wisconsin	Kelly Jackson	THPO		
Lac Vieux Desert Band of Lake Superior Chippewas	James Williams, Jr.	Chairman		
Lac Vieux Desert Band of Lake Superior Chippewas	Giiwegiizhigookway Martin	THPO	Letter 25 Aug 05	No intersest
Leech Lake Reservation Business Committee	George Goggleye	Chairman		
Leech Lake Reservation Business Committee	Gina Papasodora	Deputy THPO	Letter 15 Sep 05	No interest
Little River Band of Ottawa	Bob Guenthardt	Ogema		
Little River Band of Ottawa	THPO/NAGPRA Representative			

Little Traverse Bay Band of Odawa	Frank Ettawageshik	Chairman		
Little Traverse Bay Band of Odawa	Leonard Mitchell	Cultural Preservation Coordinator		
Match-e-be-nash-she-wish Band of Pottawatomi	David K. Sprague	Chairperson		
Match-e-be-nash-she-wish Band of Pottawatomi	John Shagonaby	NAGPRA Representative		
Miami Nation of Oklahoma	Floyd E. Leonard	Chief		
Miami Nation of Oklahoma	Julie Olds	NAGPRA Representative		
Mille Lacs Reservation Business Committee	Melanie Benjamin	Chief Executive		
Mille Lacs Reservation Business Committee	Natalie Weyaus	THPO		
Minnesota Chippewa Tribe (Executive Committee)	Peter Defoe	President		
Minnesota Chippewa Tribe (Executive Committee)	Travis Annette	NAGPRA Representative		
Nottawaseppi Huron Band of Potawatomi	Laura Spurr	Chairperson		
Nottawaseppi Huron Band of Potawatomi	Lorraine Shananaquet	NAGPRA Representative		
Oneida Indian Nation	Raymond Halbritter	Nation Representative		
Oneida Indian Nation	Tony Wonderly	NAGPRA Representative		
Oneida Tribe of Indians of Wisconsin	Christina Danforth	Chairwoman		
Oneida Tribe of Indians of Wisconsin	Carol Cornelius	Cultural Heritage Department		
Onondaga Indian Nation	Irving Powless, Jr.	Chief		
Onondaga Indian Nation	Tony Gonyea	THPO		
Ottawa Tribe of Oklahoma	Charles Dawes	Chief		

Ottawa Tribe of Oklahoma	Rhonda Dixon	Tribal Historian		
Pokagon Band of Potawatomi	John Miller	Chairman		
Pokagon Band of Potawatomi	John Warren	NAGPRA Representative		
Prarie Band of Potawatomi	Zach Pahmahmie	Chairman		
Prarie Band of Potawatomi	Rey Kitchkumme	NAGPRA Representative		
Red Cliff Band of Lake Superior Chippewa	Jean Buffalo-Reyes	Chairman		
Red Cliff Band of Lake Superior Chippewa	Lisa Bresette	NAGPRA Representative		
Red Lake Band of Chippewas	Floyd Jordain	Chairman		
Red Lake Band of Chippewas	Jody Beaulieu	NAGPRA Representative		
Sac & Fox Nation of Missouri in Kansas and Nebraska	Sandra Keo	Chairwoman		
Sac & Fox Nation of Missouri in Kansas and Nebraska	Deanne Bahr	NAGPRA Representative	Letter 8 Sept 05	Not interested in RTLS
Sac & Fox Nation, Oklahoma	Don Abney	Principal Chief		
Sac & Fox Nation, Oklahoma	Sandra Kaye Massey	NAGPRA Representative		
Sac & Fox Tribe of the Mississippi in Iowa	Alex Walker	Chairman		
Sac & Fox Tribe of the Mississippi in Iowa	Johnathan Buffalo	Historic Preservation Coordinator	Letter 25 Aug 05	No interest in project area unless NAGPRA items or human remains are discovered.
Saginaw Chippewa Tribe of Michigan	Audrey Falcon	Chief		
Saginaw Chippewa Tribe of Michigan	Wilma Henry	7th Generation Cultural Center		

Sault Ste. Marie Tribe of Chippewas	Aaron Payment	Chairman		
Sault Ste. Marie Tribe of Chippewas	Cecil Pavlat			
Seneca Nation of Indians	Barry E. Snyder, Sr.	President		
Seneca Nation of Indians	Maurice John, Jr.	Cultural Resources Technician		
Seneca-Cayuga Tribe of Oklahoma	LeRoy Howard	Chief		
Seneca-Cayuga Tribe of Oklahoma	Patty Shinn	NAGPRA Representative		
Shawnee Tribe	Ron Sparkman	Chairman		
Shawnee Tribe	Nick Smith	NAGPRA Director		
Sokaogon Chippewa (Mole Lake) Community of Wisconsin	Sandra L. Rachal	Chariwoman		
Sokaogon Chippewa (Mole Lake) Community of Wisconsin	THPO/NAGPRA Representative			
St. Croix Chippewas of Wisconsin	David Merrill	President		
St. Croix Chippewas of Wisconsin	Tom Tomacary	THPO		
St. Regis Mohawk Tribe	Jim Ransom	Chief		
St. Regis Mohawk Tribe	Sheree Bonaparte	THPO		
Stockbridge-Munsee Community of Wisconsin	Robert Chicks	President		
Stockbridge-Munsee Community of Wisconsin	Sherry White	Cultural Resources Manager		
Tonawanda Band of Seneca	Emerson Webster	Chief		
Tonawanda Band of Seneca	Darwin Hill	Tribal Clerk		
Turtle Mountain Band of Chippewa	Ken Davis	Chairman		

Turtle Mountain Band of Chippewa	Brady Grant	THPO		
Tuscarora Nation	Leo R. Henry	Chief		
Tuscarora Nation	Richard Hill	Standing Committee Chairperson		
White Earth Reservation Business Committee	Doyle I. Turner	Chairman		
White Earth Reservation Business Committee	Douglas Hodges	NAGPRA Director		
Wyandotte Nation	Leaford Bearskin	Chief		
Wyandotte Nation	Sherri Clemons	Cultural Liaison Specialist		

STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT
2825 West Dublin Granville Road
Columbus, Ohio 43235-2789

July 29, 2005

Facilities Management
Environmental Office

The Honorable Lawrence F. Snake, President
Delaware Nation
PO Box 825
Anadarko, Oklahoma 73005

Dear President Snake:

The Ohio Army National Guard intends to revise an Integrated Natural Resources Management Plan (INRMP) at the Ravenna Training and Logistics Site (RTLS). RTLS is a 19,938 acre training site located in northeastern Ohio between the cities of Newton Falls and Ravenna. It is approximately 45 miles southeast of Cleveland. The majority of the training site is in Portage County and a small portion extends into Trumbull County. There has been a natural resources management plan for this facility since the mid-1960's. A revision is required on the plan every five years. The last revision was completed in 2001. Prior to implementing this action, we wish to consult with federally recognized Indian Nations that may have ancestral ties to the area.

If you have an interest, we invite you to join us as a consulting party as we revise the RTLS Integrated Natural Resources Management Plan in accordance with 36 CFR Part 800.2, EO 13175, and DoD Native American and Alaska Native Policy. With your advice and assistance, we hope to maintain an ongoing cooperative relationship between your Nation and the Ohio Army National Guard. You may contact my cultural resources manager, Ms. Kimberly Ludt, at (614) 336-6569 or at kimberly.ludt@oh.ngb.army.mil. Ms. Ludt, in coordination with her counterpart in your tribe, can outline areas of concern and provide you with further information.

If you would like to confer with the senior leadership of the Ohio Army National Guard, please contact Major Tom Daugherty, my liaison and technical point of contact for this endeavor, at the address above, by telephone, at (614) 336-7095 or by fax, at (614) 336-7154. Major Daugherty can also be reached at thomas.daugherty@oh.ngb.army.mil.

Sincerely,

Gregory L. Wayt
Major General (Ohio)
The Adjutant General

cc: Tamara Francis, NAGPRA Director

Delaware Nation
NAGPRA/Cultural Preservation Office
P.O. Box 825, Anadarko, OK 73005
Phone: (405) 247-2448
Fax: (405) 247-9393

13 September 2005

ATTN: Gregory L. Wayt, Major General (Ohio)

State of Ohio
Adjutant General's Department
2825 West Dublin Granville Road
Columbus, Ohio 43235-2789

RE: Projects- Revision of Integrated Natural Resources Management Plan, Ravenna Training and Logistics Site.

Dear Major General Wayt,

Thank you for contacting the Delaware Nation regarding the above referenced project. The Delaware Nation is committed to protecting archaeological sites that are important to tribal heritage, culture, and religion. Furthermore, the tribe is particularly concerned with archaeological sites that may contain human burial remains and associated funerary objects.

On August 18, 2005 the Delaware Nation NAGPRA Department received a correspondence from the State of Ohio Adjutant General's Department. The county is of interest to the Delaware Nation, therefore we are requesting not to be a consulting party for the referenced project. Please update us as to the progress of the project and contact us immediately if something is found.

We appreciate your cooperation in contacting the Delaware Nation. Should you have any questions, feel free to contact me.

Sincerely,

Tamara Francis, Director
NAGPRA/Cultural Preservation

Ludt, Kimberly S NGOH

From: Eastern Shawnee Tribe Chief Enyart [estochief@hotmail.com]
Sent: Tuesday, September 06, 2005 3:57 PM
To: Ludt, Kimberly S NGOH
Subject: INRMP @ RTLS

September 6, 2005

RE: REVISED INTEGRATED NATURAL RESOURSES MANAGEMENT pLAN (INRMP) AT THE RAVENNA TRAINING AND LOGISTICS SITE PORTAGE COUNTY AND TRUMBULL COUNTY, OHIO

To Whom It May Concern:

Thank you for notice of the referenced project(s). The Eastern Shawnee Tribe of Oklahoma is currently unaware of any documentation directly linking Indian Religious Sites to the proposed construction. In the event any items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) are discovered during construction, the Eastern Shawnee Tribe request notification and further consultation.

The Eastern Shawnee Tribe has no objection to the proposed construction. However, if any human skeletal remains and/or any objects falling under NAGPRA are uncovered during construction, the construction should stop immediately, and the appropriate persons, including state and tribal NAGPRA representatives contacted.

Sincerely,
Jo Ann Beckham, Administrative Assistant
Eastern Shawnee Tribe of Oklahoma

Ludt, Kimberly S NGOH

From: Daugherty, Tom MAJ NGOH
Sent: Tuesday, August 30, 2005 1:02 PM
To: Ludt, Kimberly S NGOH
Subject: FW: Ravenna Training and Logistics Site Integrated Natural Resources Management Plan revisions

FYI

-----Original Message-----
From: Summer Cohen [mailto:kbthpo@up.net]
Sent: Tuesday, August 30, 2005 12:20 PM
To: Daugherty, Tom MAJ NGOH
Subject: Ravenna Training and Logistics Site Integrated Natural Resources Management Plan revisions

Dear Major Daugherty:

The Keweenaw Bay Indian Community (KBIC) received your requests for comments or interest. KBIC has no interests documented at this time in the proposed project areas: Ravenna Training and Logistics Site, in Northeastern Ohio between the cities of Newton Falls and Ravenna. If the scope of work changes in any way or if artifacts or human remains are discovered, please notify KBIC immediately so we can assist in making an appropriate determination.

Please forward a copy of any request for future opportunities to review and comment to Summer Sky Cohen, Coordinator, Tribal Historic Preservation Office, at the address listed below. Please keep us informed of future projects as KBIC plans to increase our efforts to identify and document sites in the area.

Thank you for this opportunity to review and comment.

Respectfully,

/s/

Summer Cohen, Officer
Tribal Historic Preservation Office
Keweenaw Bay Indian Community
107 Beartown Road
Baraga, Michigan 49908
906-353-6272
906-353-6869 fax

STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT
2825 West Dublin Granville Road
Columbus, Ohio 43235-2789

July 29, 2005

Facilities Management
Environmental Office

The Honorable James Williams, Jr., Chairman
Lac Vieux Desert Band of Lake Superior Chippewa Indians
PO Box 249
Watersmeet, Michigan 49969

Dear Chairman Williams:

The Ohio Army National Guard intends to revise an Integrated Natural Resources Management Plan (INRMP) at the Ravenna Training and Logistics Site (RTLS). RTLS is a 19,938 acre training site located in northeastern Ohio between the cities of Newton Falls and Ravenna. It is approximately 45 miles southeast of Cleveland. The majority of the training site is in Portage County and a small portion extends into Trumbull County. There has been a natural resources management plan for this facility since the mid-1960's. A revision is required on the plan every five years. The last revision was completed in 2001. Prior to implementing this action, we wish to consult with federally recognized Indian Nations that may have ancestral ties to the area.

If you have an interest, we invite you to join us as a consulting party as we revise the RTLS Integrated Natural Resources Management Plan in accordance with 36 CFR Part 800.2, EO 13175, and DoD Native American and Alaska Native Policy. With your advice and assistance, we hope to maintain an ongoing cooperative relationship between your Nation and the Ohio Army National Guard. You may contact my cultural resources manager, Ms. Kimberly Ludt, at (614) 336-6569 or at kimberly.ludt@oh.ngb.army.mil. Ms. Ludt, in coordination with her counterpart in your tribe, can outline areas of concern and provide you with further information.

If you would like to confer with the senior leadership of the Ohio Army National Guard, please contact Major Tom Daugherty, my liaison and technical point of contact for this endeavor, at the address above, by telephone, at (614) 336-7095 or by fax, at (614) 336-7154. Major Daugherty can also be reached at thomas.daugherty@oh.ngb.army.mil.

Sincerely,

Project #: RTLS training

Gregory L. Wayt
Major General (Ohio)
The Adjutant General

cc: Giiwegiizhigookway Martin, THPO 8/25/05

Leech Lake Band of Ojibwe

September 15, 2005

State of Ohio
Adjutant General's Office
Attn: Gregory L. Wayt
2825 West Dublin Granville Road
Columbus, Ohio 43235-2789

RE: **Proposed Lake Integrated Natural Resources Management Plan**
Portage and Trumbull Counties, Ohio
LL-THPO Number: 05-211-NCRI

Dear Mr. Wayt:

Thank you for the opportunity to comment on the above-referenced project. It has been reviewed pursuant to the responsibilities given the Tribal Historic Preservation Officer by the National Historic Preservation Act of 1966, as amended in 1992 and the Procedures of the Advisory Council on Historic Preservation (38CFR800).

We are not interested in consulting at this time.

You may contact me at (218) 335-2940 if you have questions regarding our review of this project. Please refer to the LL-THPO Number as stated above in all correspondence with this project.

Respectfully submitted,

Gina M. Papasodora
Tribal Historic Preservation Officer

Sac and Fox Nation of Missouri in Kansas and Nebraska

305 North Main Street • Reserve, Kansas 66434
Phone (785) 742-7471 • Fax (785) 742-3785

September 8, 2005

Kimberly Ludt
State of Ohio
Adjutant General's Department
2825 West Dublin
Granville Road
Columbus Ohio 43235-2789

Dear Ms. Ludt

Thank you for your letter, which is in compliance with Section 106 of the National Historic Preservation Act, and Section 110.

The Sac and Fox Nation of Missouri in Kansas and Nebraska do not have an interest in this site:

Ravenna Training and Logistics Site

There are two other bands of Sac and Fox that also need to be contacted, the Sac and Fox Nation of Oklahoma and the Sac and Fox of the Mississippi in Iowa.

Johnathan Buffalo, Sac and Fox of the Mississippi in Iowa
349 Meskwaki Rd.
Tama, IA 52339-9629

Sandra Massey, Sac and Fox Nation of Oklahoma
Rt. 2, Box 246
Stroud, OK 74079

If you have any questions, please contact me at the number or address above.

Sincerely,

Deanne Bahr
Sac and Fox Nation of Missouri in Kansas and Nebraska
NAGPRA Contact Representative

Sac & Fox Tribe of the Mississippi in Iowa

349 Meskwaki Road, Tama, IA 52339-9629 • (641) 484-4678 FAX (641) 484-5424

"MESKWAKI NATION"

August 25, 2005

State of Ohio
Major Tom Daugherty
Adjutant General's Department
2825 West Dublin Granville Road
Columbus, OH 43235-2789

Dear Major Tom Daugherty:

This is in response to Gregory L. Wayt's letter dated July 29, 2005 concerning the project:

RTLS-19,938 acre training site
Northeaster Ohio between Newton Falls and Ravenna
45 miles southeast of Cleveland, Portage County and Trumball County

At this time, the Historical Preservation Department of the Sac and Fox of the Mississippi in Iowa has determined the above listed has:

- ☐ No interest in the area geographically
- ☐ No comment on the proposed undertaking
- ☑ No objections. However, if human skeletal remains and/or any objects falling under NAGPRA are uncovered during construction, please stop immediately and notify the NAGPRA Representative, Johnathan L Buffalo.
- ☐ Have an objection or require additional project information. Please send the following: _____.

Sincerely,

Johnathan L. Buffalo
Historical Preservation Coordinator
Sac and Fox of the Mississippi in Iowa

Cc: File

From: Kramer, Dan [Dan.Kramer@dnr.state.oh.us]
Sent: Friday, December 29, 2006 4:32 PM
To: Morgan, Timothy M NGOh
Cc: Herrick, Jeff; Risley, Dave
Subject: Ravenna INRMP Review & Comment

Tim,

Thanks for providing us here at the District 3 Wildlife Office with the opportunity to review the draft of the revised Integrated Natural Resources Management Plan for the Ravenna Training & Logistics Site. Your cover letter describes this revision as "basically an evaluation, reorganization, and update of the 2001 INRMP". In comparing the two I would agree completely and compliment you on the thoroughness of this document.

I have no specific comments or questions on the draft revision. The sections covering fish and wildlife management and controlled harvest opportunities are consistent with the previous plan and current program administration. Information on species occurrence has been updated where appropriate based on information obtained from surveys conducted since the last version was written.

I will note that, as you have indicated to me at our annual joint agency meeting, you have offered and budgeted to fund the Division of Wildlife's aerial deer survey costs. I need to inquire how best to accept these funds on our end. Our schedule of deer survey priorities does list RTLS to be surveyed this winter when conditions allow. Additionally, our protocols now include duplicate surveys to compare results from visual, snow cover surveys and FLIR (Forward Looking Infrared) surveys. I will keep you informed as plans are made and survey dates are set.

Dan

****

Daniel L. Kramer

Wildlife Management Supervisor

Wildlife District 3

912 Portage Lakes Drive

Akron, OH 44319

(330) 644-2293

dan.kramer@dnr.state.oh.us

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6950 Americana Parkway, Suite H
Reynoldsburg, Ohio 43068-4127

(614) 469-6923
Fax: (614) 469-6919

January 8, 2007

Mr. Timothy Morgan
The Adjutant General's Department
Ravenna Training and Logistics Site
1438 State Route 534 SW
Newton Falls, OH 44444

Dear Mr. Morgan:

This is in response to your November 16, 2006 Preliminary Draft Revised Integrated Natural Resources Management Plan (INRMP) for the Ravenna Training and Logistics Site, Ohio for 2007-2011.

The Service has reviewed the preliminary draft revised INRMP, and at this time, we have no additional comments. Please note that this version of the INRMP is not substantially different from the last version, which ran from 2001-2006. Updates have been provided where new data became available due to implementation of the last INRMP, including completion of biological surveys. In general, the basic natural resources management programs and policies are not being altered with this revision.

Upon completion of the final draft of the INRMP, please submit it to the US Fish and Wildlife Service's Region 3 Regional Office, Bishop Henry Federal Building, 1 Federal Drive, Fort Snelling, MN 55111, Attention, Tim Patronski. Please include a cover letter requesting Regional Directory concurrence.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (ESA), as amended, and are consistent with the intent of the National Environmental Policy Act of 1969.

If you have questions, or if we may be of further assistance in this matter, please contact Megan Seymour at extension 16 in this office.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Supervisor

cc: ODNR, DOW, SCEA Unit, Columbus, OH
Mr. Tim Patronski, USFWS, Fort Snelling, MN

-----Original Message-----
From: Bankey, Mindy [mailto:Mindy.Bankey@dnr.state.oh.us]
Sent: Friday, February 09, 2007 4:22 PM
To: Morgan, Timothy M NGOh
Subject: Draft INRMP -- Ravenna

ODNR COMMENTS TO Timothy M. Morgan, Ohio Army National Guard, RTLS, Newton
Falls, OH

Location: Ravenna Training and Logistics Site, 1438 SR 534 SW, Newton Falls,Ohio.

Project: Preliminary Draft Revised Integrated Natural Resources Management Plan (INRMP) for the RTLS site, which is an evaluation, reorganization and update from the 2001 INRMP.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

The Ohio Department of Natural Resources has reviewed the draft INRMP and provides the following suggestion. No further comments or concerns were offered.

The concrete dam across South Fork Eagle Creek, just west of Wadsworth Road may need further evaluation as a result of the dam's wing walls being undercut, as noted in the INRMP, as well as the associated Boy Scott Pond siltation from the construction of the ammunition plant. Dam failure could pose a potential safety hazard and cause siltation or a reduction in water quality of South Fork Eagle Creek.

To add this dam to the ODNR, Division of Water's Dam Inventory, information can be obtained at:

http://www.dnr.state.oh.us/water/dsafety/lowhead dams/missing rpt form.htm

ODNR appreciates the opportunity to provide these comments. Please contact Mindy Bankey at 614.265.6836 if you have questions about these comments or need additional information.

Mindy Bankey
Environmental Administrator
Division of Real Estate & Land Management Ohio Department of Natural Resources
2045 Morse Rd, C4
Columbus, Ohio 43229-6693
614.265.6836
Fax 614.267.4764


303
Wadsworth Rd
Ravenna Arsenal St Wn St 3
Shalley Rd
N
W
E
S
© 2005 Google
© 2007 Navteq
Pointer 41°13'37.91" N 81°04'41.56" W elev 1001 ft
Streaming 100%
Eye alt 10427 ft

Morgan, Timothy M.

From: Tadsen, Tom A. LTC
Sent: Monday, July 21, 2003 8:07 AM
To: Morgan, Timothy M.; Daugherty, Tom CPT; Oxley, Brett R. CPT
Subject: FW: Boy Scout Dam

FYI.

-----Original Message-----
From: Shapiro, Daniel J., OC
Sent: Thursday, July 17, 2003 10:34 AM
To: Wright, Michael MAJ
Cc: Tadsen, Tom A. LTC
Subject: Boy Scout Dam

I spoke with Patty at ODNR"s dept. of water. She said the dam is too small to qualify to have them inspect it, so we will probably have to have a consultant do the work. I'll write it up that way. If I can't get the state to inspect the bridges, I'll tie the dam into the bridge inspection scope of work.

Daniel Shapiro
AGOH-A/FM
Analyst I
(614) 336-7056

Morgan, Timothy M.

From: Banachowski, Keith [Keith.Banachowski@dnr.state.oh.us]
Sent: Monday, July 21, 2003 7:02 AM
To: Morgan, Timothy M.
Subject: Ravenna Ordnance Plant Pond Dam

Tim -
I am writing to you with regard to our discussion during the week of July 14, 2003. You had asked for information about a dam located 3000 feet south and 300 feet west of the intersection of State Route 303 and Wadsworth Road.

The Dam Safety Engineering Program has an inventory record for this dam: file number 1110-014. The record shows that the height of the dam is less than 10 feet high and the pool area is about 2.4 acres - giving the dam a potential storage capacity at the top of dam elevation of about 10 acre-feet.

The Ohio Revised Code provides exemptions from the dam safety laws and rules based on a dam's height and total storage capacity. This dam appears to meet two of the exemptions: (1) it impounds less than 15 acre-feet at the top of dam elevation and (2) it is less than 10 feet high and impounds less than 50 acre-feet of storage. Please refer to fact sheets "34 Dam Safety: Construction Permits for Dams" and "29 Dam Safety: Classification of Structures" on the Division of Water's web site. http://www.dnr.state.oh.us/water/pubs/#anchor12197693 Fact sheet number 34 describes the exemptions (valid for construction permits as well as existing dams) and fact sheet number 29 describes the measurement of height and storage capacity.

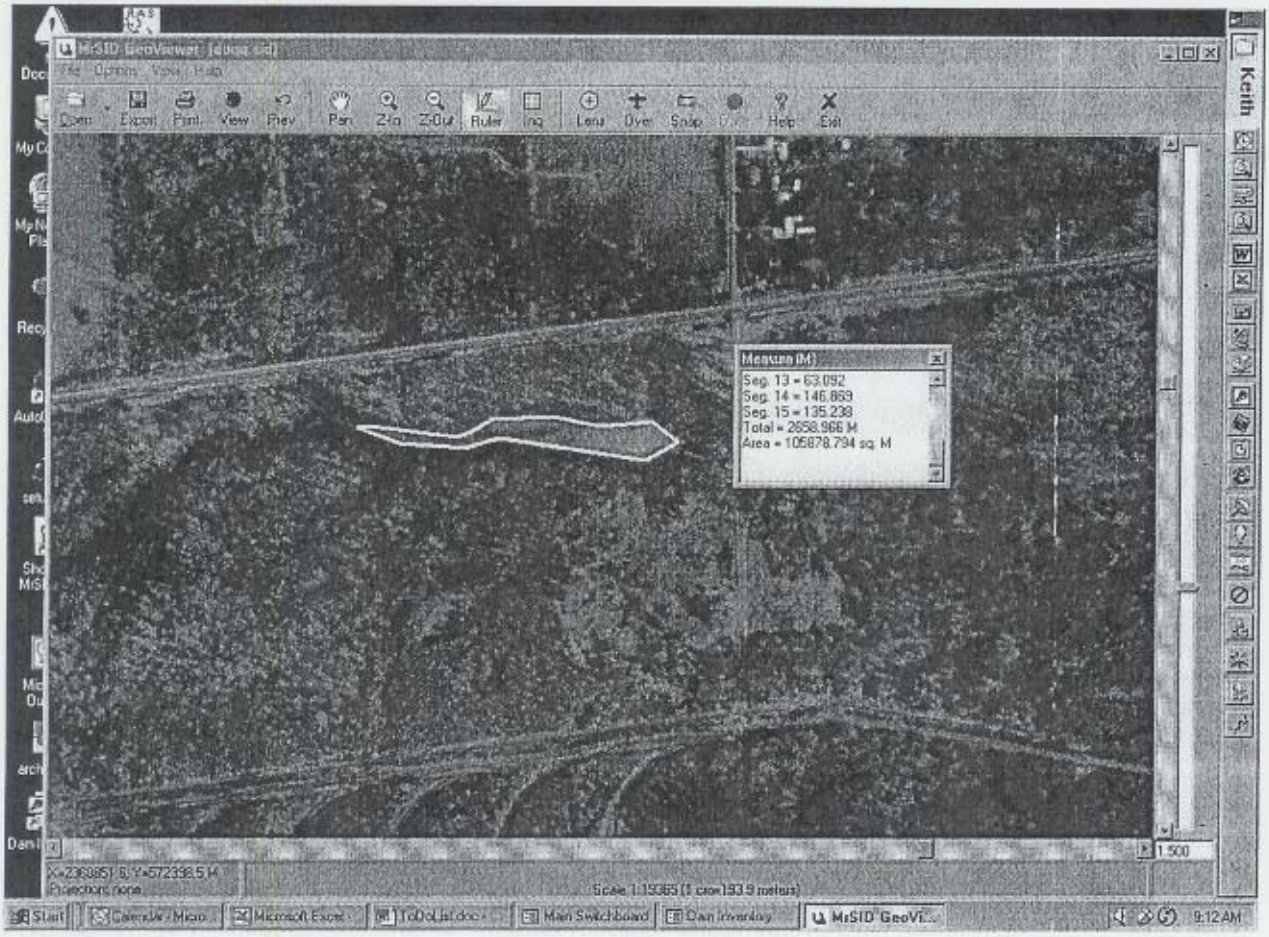
The owner of a dam that is exempt from the Division of Water's jurisdiction does not need the Division of Water's approval for dredging or repair as long as these activities do not modify the storage or height of the dam in a way that would void the exemption. (For example, raising the dam elevation by 6 feet or excavating 6 acre-feet [about 10,000 cubic yards] of soil and sediment from the impoundment would potentially void one or both exemptions).

Please note that if the height of the dam is currently higher than the division's records indicate, you may need approval for modifying the dam (and other requirements may also apply).

Please contact me with an questions or comments,

Keith Banachowski, P.E.
Program Manager
Dam Safety Engineering Program
Division of Water, ODNR
614-265-6738

20030721 Ravenna 1110-014.doc



106000 / 43560 = 2.4 acres

Max height of 10 feet, consider upstream toe to TOD of 9 feet (1/3 * 9 * 2.4 = 7.2); appears exempt.

Comment #	*The comment refers to the* Chapter	Section	Page	Paragraph	Line	Sentence	Comments - Ravenna Training and Logistic Site DEC/JAN 07	Reviewer	Office of Reviewer	Action Taken by State to Address the Comment
1							The Service has reviewed the preliminary draft revised INRMP, and at this time, we have no additional comments. Please note that this version of the INRMP is not substantially different from the last version, which ran from 2001-2006. Updates have been provided where new data became available due to implementation of the last INRMP, including completion of biological surveys. In general, the basic natural resources management programs and policies are not being altered with this revision.	Mary Knapp, Ph.D.	USFWS, Reynoldsburg Field Office	Concur with comment. Please note that the original plan was dated Nov 2001 and the implementation period was actually FY2002-2007.
2							Upon completion of the final draft of the INRMP, please submit it to the US Fish and Wildlife Service's Region 3 Regional Office, Bishop Henry Federal Building, 1 Federal Drive, Fort Snelling, MN 55111, Attention, Tim Patronski. Please include a cover letter requesting Regional Director concurrence.	Mary Knapp, Ph.D.	USFWS, Reynoldsburg Field Office	Concur with comment and will submit fdINRMP to the Regional Director as requested.
3							The concrete dam across South Fork Eagle Creek, just west of Wadsworth Road may need further evaluation as a result of the dam's wing walls being undercut, as noted in the INRMP, as well as the associated Boy Scout Pond siltation from construction of the ammunition plant. Dam failure could pose a potential safety hazard and cause siltation or a reduction in water quality of South Fork Eagle Creek. To add this dam to the ODNR, Division of Water's Dam Inventory, information can be obtained at: http://www.dnr.state.oh.us/water/dsafety/lowhead_dams/missing_rpt_form.htm.	Mindy Bankey	Ohio Department of Natural Resources	In 2003 the OHARNG coordinated with Mr. Keith Banachowski, Program Manager, Dam Safety Engineering Program, Division of Water, ODNR on this issue. There is an inventory record (file number 1110-014) for this dam. The record indicates the dam is less than 10 feet high with a pool area of approximately 2.4 acres. Per the Ohio Revised Code this dam is exempt from safety law rules because (1) it impounds less than 15 acre-feet and (2) it is less than 10 feet high and impounds less than 50 acre-feet of water. The dam is not in eminent danger of failure but the pond does contain a lot of silt. Our concern from failure is more for potential water quality degradation than safety. The South Fork Eagle Creek exits the RTLS 2.5 miles from the dam so water volume would be mitigated before going off post. We are open to restoring the impounded portion of the creek by controlled silt removal and demolition of the dam. The Ohio Department of Transportation has expressed some interest in this project as mitigation for stream fills within the Mahoning River watershed.
4							I have no specific comments or questions on the draft revision. The sections covering fish and wildlife management and controlled harvest opportunities are consistent with the previous plan and current program administration. Information on species occurrences has been updated where appropriate based on information obtained from surveys conducted since the last version was written.	Dan Kramer	ODNR, Division of Wildlife	Concur with comment.

5							I will note that, as you indicated to me at our annual joint agency meeting, you have offered and budgeted to fund the Division of Wildlife's aerial deer survey costs. I need to inquire how best to accept these funds on our end. Our schedule of deer survey priorities does list RTLS to be surveyed this winter when conditions allow. Additionally, our protocols now include duplicate surveys to compare results from visual, snow cover surveys and FLIR (Forward Looking Infrared) surveys. I will keep you informed as plans are made and survey dates are set.	Dan Kramer	ODNR, Division of Wildlife	Correct, we can fund the aerial survey the ODOW does for the RTLS. The payment mechanism will be an Intra-State Transfer Voucher (ISTV). MAJ Tom Daugherty is the funds manager. Submit a cost to me (Tim Morgan) and I will forward it to MAJ Daugherty for transfer of funds. I will also need to know the ODOW point of contact for the transaction.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Bishop Henry Whipple Federal Building
1 Federal Drive
Fort Snelling, MN 55111-4056

IN REPLY REFER TO:
FWS/AF

FEB - 8 2008

Major Thomas Daugherty
Environmental Program Manager
Ohio Army National Guard, AGOH-FM-EN
2825 W. Dublin Granville Road
Environmental Office
Columbus, Ohio 43235-2789

Dear Major Daugherty:

This letter is provided in response to a request for U.S. Fish and Wildlife Service concurrence on the Integrated Natural Resource Management Plan (INRMP) for the Ravenna Training and Logistics Site in Portage and Trumbull Counties, Ohio.

We fully support the recommendations of our Renoldsburg Ecological Services Field Office and concur with this INRMP. We appreciate your efforts to conserve natural resources on military lands while fulfilling the military mission and your willingness to work collaboratively with the Service. Please contact Mr. Tim Patronski, Region 3 Sikes Act Coordinator, at (612) 713-5168, if we can be of further assistance.

Sincerely,

Charles M. Wooley
Acting Regional Director

Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR SEAN D. LOGAN, DIRECTOR

December 3, 2007

Timothy M. Morgan
Environmental Supervisor
The Adjutant General's Department
Ravenna Training and Logistics Site
1438 State Route 534 SW
Newton Falls, OH 44444

Dear Mr. Morgan:

The Ohio Department of Natural Resources has completed review of the latest Integrated Natural Resources Management Plan (INRMP) for Ravenna and has found this material to be acceptable. We are providing this letter as recognition of our mutual agreement with regards to the INRMP.

Thank you for the opportunity to review and comment on the INRMP for this particular facility. Your interest and concern for Ohio's natural resources are greatly appreciated. If you have any questions, please do not hesitate to contact me at (614) 265-6879 or Vicki Deisner, Environmental Administrator, at (614) 265-6344.

Sincerely,

Sean D. Logan
Director

SDL/VD:pju

Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

April 28, 2015

Brian Riley
Ohio Army National Guard
Camp Ravenna Joint Military Training Center
1438 State Route 534 SW
Newton Falls, OH 44444

RE: Concurrence with Integrated Natural Resource Management Plan (December 2014 version)

Dear Mr. Riley:

The Ohio Department of Natural Resources (ODNR) has reviewed the December 2014 version of the Integrated Natural Resource Management Plan and concurs with its content. Thank you for coordinating with ODNR and the opportunity to comment.

If you have any questions, please contact John Kessler, in the Office of Real Estate, at (614) 265-6621.

Sincerely,

James Zehringer
Director

JZ/jk/st

c: Nathan Reardon, Division of Wildlife

STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT
Camp Ravenna Joint Military Training Center
Environmental Office
1438 State Route 534 SW
Newton Falls, Ohio 44444-9520

27 February 2015

John Kessler, P.E.
Environmental Services Administrator
ODNR, Office of Real Estate
2045 Morse Road, Building E-2
Columbus, OH 43229-6605

Reference: Request for Agency Concurrence; Final Updated Integrated Natural Resources Management Plan (fINRMP) for Camp Ravenna Joint Military Training Center (CRJMTC), Portage and Trumbull Counties, Ohio.

Dear Mr. Kessler,

Please find attached fINRMP along with associated Record of Environmental Consideration (REC), located in Appendix C. This fINRMP is an update of an existing INRMP that was originally approved in November 2001 and previously updated in March 2008. A preliminary draft of the updated INRMP was sent to your office and to the U.S. Fish and Wildlife Service (USFWS) in March 2014 for review and comment. In your response to us dated 15 May 2014, you stated that the Ohio Department of Natural Resources (ODNR) did not have any comments on the draft INRMP. The only comments and questions regarding the draft INRMP were received by National Guard Bureau (NGB) in their response to us dated 23 May 2014. These comments and questions have been addressed on the errata sheet (included in Appendix A) and incorporated into the body of the document. A copy of the agency comment and response table has also been placed before the cover page of the fINRMP for quick reference.

You may recall that at our Review for Operation & Effect meeting held in the Environmental Office at Camp Ravenna on 19 December 2012, it was agreed to by each of the three cooperating agencies that INRMP implementation should continue without any changes being made to management program or philosophies. At this five-year meeting, each agency agreed that the OHARNG would update the INRMP to improve maps, address relevant invasive species, update regulations, continue scheduled timber harvests and other conservation projects, and include results from the past five years of Planning Level Survey data including T&E species found on site since last INRMP Update. No substantive changes were made to the Camp Ravenna INRMP.

Please note that in addition to the inclusion of the aforementioned errata sheet with resolution to comments incorporated into the fINRMP, as well as minor grammatical and punctual changes throughout the text, the following edits were made:

- Black bear (*Ursus americanus*), a state endangered species, has been included in discussion of mammals present at CRJMTC (Section 4.3.1). This mammal has not been seen on site since October 2013.

- INRMP conservation projects featured in Table 18 updated through FY19 per approval from USFWS on 1 December 2014 (Table 18, Appendix A).

- Additional plant species found on site throughout 2014 by Camp Ravenna's Natural Resources Program Manager, including the state endangered Appalachian quillwort (*Isoetes engelmannii*) and pasture dewberry (*Rubus biformispinus*), a newly recorded species for Ohio, have been included in the catalog of vascular plants and data submitted to the ODNR – Natural Heritage Program (Table 14, Appendix D).

- Creation of Appendix J – *Camp Ravenna Federally Protected Species Management Guidance.* This appendix addresses management guidance for all federally protected species present at Camp Ravenna. Also included in this section is our complete Biological Evaluation for the Proposed Endangered Northern Long-Eared Bat (*Myotis septentrionalis*), as well as our letter of concurrence from the USFWS dated 21 January 2015. Because of the addition of Appendix J, the Glossary has been moved to Appendix K.

The Ohio Army National Guard (OHARNG) is requesting written concurrence on the updated CRJMTC fINRMP from the ODNR and the USFWS. At this time, we are routing the fINRMP internally for signature in addition to soliciting a formal concurrence letter from your agency's director. If your agency concurs with the enclosed fINRMP, please provide the OHARNG with a letter of concurrence from the Director of the ODNR. Once our office receives the final signed signature page, as well as concurrence letters from the USFWS and NGB, the fINRMP will become final and copies will be distributed to each cooperating agency in electronic format unless requested otherwise.

Your concurrence letter should be addressed to:

Mr. Brian P. Riley
Natural Resources Program Manager
Camp Ravenna Joint Military Training Center – Environmental Office
1438 State Route 534 SW
Newton Falls, Ohio 44444-9520

Should you have any questions concerning the contents of this letter or the fINRMP, please feel free to contact me at (614) 336-4564 or brian.p.riley17.nfg@mail.mil.

Sincerely,

Brian P. Riley
Ohio Army National Guard
Natural Resources Program Manager

Attachment

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994

March 17, 2015

Brian Riley
Natural Resources Manager
Camp Ravenna Joint Military Training Center – Environmental Office
1438 State Route 534 SW
Newton Falls, Ohio 44444-9520

Dear Mr. Riley,

TAILS#: 03E15000-2015-TA-0895

This is in response to your Final Updated Integrated Natural Resources Management Plan (INRMP) for Camp Ravenna Joint Military Training Center (CRJMTC), received March 13, 2015.

The Service has reviewed the final updates to the INRMP. The Service concurs with your updates, including the addition of Appendix J that addresses management guidance for all federally protected species present at CRJMTC. Appendix J includes your January 2015 Biological Evaluation (BE) for the proposed endangered northern long-eared bat (*Myotis septentrionalis*) for potential impacts of various development, maintenance, training, and conservation practices conducted at CRJMTC. The Service's January 21, 2015 concurrence letter for the BE is also included in this appendix.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (ESA), as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy.

If you have questions, or if we may be of further assistance in this matter, please contact Angela Boyer at extension 22 in this office.

Sincerely,

for Dan Everson
Field Supervisor

STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT
Camp Ravenna Joint Military Training Center
Environmental Office
1438 State Route 534 SW
Newton Falls, Ohio 44444-9520

27 February 2015

Megan Seymour
Acting Field Supervisor
US Fish & Wildlife Service
4625 Morse Rd., Ste. 104
Columbus, Ohio 43230-8325

Reference: Request for Agency Concurrence; Final Updated Integrated Natural Resources Management Plan (fINRMP) for Camp Ravenna Joint Military Training Center (CRJMTC), Portage and Trumbull Counties, Ohio.

Dear Ms. Seymour,

Please find attached fINRMP along with associated Record of Environmental Consideration (REC), located in Appendix C. This fINRMP is an update of an existing INRMP that was originally approved in November 2001 and previously updated in March 2008. A preliminary draft of the updated INRMP was sent to your office and to the Ohio Department of Natural Resources (ODNR) in March 2014 for review and comment. In your agency's response to us dated 24 March 2014, you stated that the USFWS did not have any comments on the draft INRMP. The only comments and questions regarding the draft INRMP were received by National Guard Bureau (NGB) in their response to us dated 23 May 2014. These comments and questions have been addressed on the errata sheet (included in Appendix A) and incorporated into the body of the document. A copy of the agency comment and response table has also been placed before the cover page of the fINRMP for quick reference.

You may recall that at our Review for Operation & Effect meeting held in the Environmental Office at Camp Ravenna on 19 December 2012, it was agreed to by each of the three cooperating agencies that INRMP implementation should continue without any changes being made to management program or philosophies. At this five-year meeting, each agency agreed that the OHARNG would update the INRMP to improve maps, address relevant invasive species, update regulations, continue scheduled timber harvests and other conservation projects, and include results from the past five years of Planning Level Survey data including T&E species found on site since last INRMP Update. No substantive changes were made to the Camp Ravenna INRMP.

Please note that in addition to the inclusion of the aforementioned errata sheet with resolution to comments incorporated into the fINRMP, as well as minor grammatical and punctual changes throughout the text, the following edits were made:

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- INRMP conservation projects featured in Table 18 updated through FY19 per approval from USFWS on 1 December 2014 (Table 18, Appendix A).

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- Creation of Appendix J – *Camp Ravenna Federally Protected Species Management Guidance*. This appendix addresses management guidance for all federally protected species present at Camp Ravenna. Also included in this section is our complete Biological Evaluation for the Proposed Endangered Northern Long-Eared Bat (*Myotis septentrionalis*), as well as our letter of concurrence from your office dated 21 January 2015. Because of the addition of Appendix J, the Glossary has been moved to Appendix K.

The Ohio Army National Guard (OHARNG) is requesting written concurrence on the updated CRJMTC flNRMP from the USFWS and the ODNR. At this time, we are routing the flNRMP internally for signature in addition to soliciting a formal concurrence letter from your agency's Field Supervisor or Acting Field Supervisor. If your agency concurs with the enclosed flNRMP, please provide the OHARNG with a letter of concurrence. Once our office receives the final signed signature page, as well as concurrence letters from the ODNR and NGB, the flNRMP will become final and copies will be distributed to each cooperating agency in electronic format unless requested otherwise.

Your concurrence letter should be addressed to:

Mr. Brian P. Riley
Natural Resources Program Manager
Camp Ravenna Joint Military Training Center – Environmental Office
1438 State Route 534 SW
Newton Falls, Ohio 44444-9520

Should you have any questions concerning the contents of this letter or the flNRMP, please feel free to contact me at (614) 336-4564 or brian.p.riley17.nfg@mail.mil.

Sincerely,

Brian P. Riley
Ohio Army National Guard
Natural Resources Program Manager

Attachment

APPENDIX B

2008-2012 INRMP IMPLEMENTATION ANALYSIS

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DEGREE OF PREVIOUS INRMP IMPLEMENTATION
FY2008-2014

Table B-1 was developed based on the twelve goals and associated objectives and projects found in **Section 7.0.** Project implementation is reviewed/discussed as part of the annual INRMP review, which is usually conducted as an onsite meeting with our partnering agencies, and tracked in **Table 18** (**Table 17** in the previous planning period INRMP). The project numbers (CONS-10, ITAM-1, SRM-1, etc) in the Proposed Program/Project column of **Table B-1** refer to specific projects indentified in **Table 18**. **Table 18** is updated as projects are funded and implemented. By the last year of the implementation period a record of expenditures and project implementation has been generated. The project funding information along with the narrative in the Implementation Status column of **Table B-1** provide a summary of overall INRMP implementation during the 2008-2014 implementation period.

Implementation was very challenging between 2008-2014, primarily due to the amount of activity at Camp Ravenna and the lack of natural resources management staff. Funding was adequate, but having the time to obligate funds was difficult. Natural resources and other environmental support efforts focused on facilitating training and training site development and maintenance projects. Wetland delineations, permitting and mitigation associated with range construction, training site development and maintenance projects where a major focus and continue to be into the next INRMP implementation period. Time and effort was prioritized to support critical current and future mission needs.

The Camp Ravenna Environmental Supervisor has been the sole natural resources management staff since the inception of Camp Ravenna, and previously when the facility was the Ravenna Army Ammunition Plant. The natural resources management requirements have steadily increased as the facility has developed into a training site. One person is not capable of handling the increased work load, especially while overseeing the facility environmental management program that includes remediation, compliance, and training site development. Probably the most important accomplishment toward the goal of managing for long term sustainability of the training site during the planning period was the hiring of a full time Natural Resources Manager at the end of FY12.

Several natural resources management programs/activities do not require much funding other than staff salaries and time. These programs include the very popular public deer hunts implemented in cooperation with the Ohio Division of Wildlife, trapping, fishing, various small game hunting, firewood permit sales, and timber harvesting. These programs have been in place for many years and continue independent of funding as long as staff is in place. One planned timber harvest was missed in FY12 due to workload prioritization and lack of staff. The INRMP cooperating agencies where understanding and did not have a problem with pushing the timber schedule out one year.

A pair of bald eagles took up residency at Camp Ravenna during the 2008-2014 planning period and had several successful years of rearing young. The eagles caused the Camp Ravenna staff to modify a couple of land navigation points to avoid potential disturbance, but had no real impact

to the training mission. Additional funding was not needed to manage the eagles, just extra time for educating the Camp Ravenna staff and occasional monitoring.

Vegetation control plan implementation continues to be a challenge. Areas get mowed that are not supposed to and others that are supposed to be mowed are not. Training and coordination is done at the management level but does not seem to make to the workers in the field. The problem again appears to be a result of workload for the maintenance staff. We have a skeleton crew doing a lot of work, which makes it hard to be successful. To further complicate matters, funding to contract mowing and herbicide treatments has not been available.

GIS data management continues to be a challenge. This was very evident while updating the INRMP maps. There is inadequate QA/QC of GIS data; most of which is obtained from contracted projects. We do not have a good understanding of what data we have and the accuracy of the data. In order to actually improve the data, a GIS staff person who can interact with the environmental supervisor and natural resources manager and get to know the training site is needed at Camp Ravenna. Funding has been available in the Environmental State Operating Budget for the last few years to meet this need but the environmental office has not been approved to implement. This is expected to be a problem for the foreseeable future.

A couple of bright spots in the program that have been made possible by having a natural resources manager on staff are the implementation of invasive plant control and grassland and young forest habitat management. Invasive plant control efforts began in FY11 and will continue into the future. Current efforts are focused on ailanthus, Japanese knotweed, autumn olive, and multiflora rose control. Areas suitable for grassland management have been designated and are on a mowing rotation to prevent woody vegetation encroachment. Other areas have been designated as young forest habitat and are managed to retain young forest characteristics. These programs help maintain diversity and enhance long-term training land sustainability. One of the latest accomplishments during this implementation period was the FY13 update of the Camp Ravenna Integrated Wildland Fire Management Plan by the Ohio Chapter of The Nature Conservancy in July 2014.

The overall degree of INRMP implementation is high, even with the challenges. The success of the program is evidenced in the fact that training has been facilitated and expanded and not curtailed by natural resources constraints. The natural resources at Camp Ravenna are in good condition and our cooperating agencies are in agreement with our program and pleased with how we are managing. The OHARNG is doing a lot of natural resources management with a small staff and limited resources. A more detailed and specific picture of implementation of the 2008-2014 implementation period can be seen by review **Table B-1**, Implementation Projects 2008-2014 within **Appendix B** and **Table 18** in Section 8 of this INRMP.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
1. Manage natural resources in a manner that is compatible with and supports the military mission while complying with applicable Federal and State laws and Army regulations and policies.	1.1: Initiate programs and projects that enhance the training land and training opportunities and/or do not unnecessarily limit training land availability.	1.1.1: Provide a trained natural resources staff to develop and manage the natural resources program and to provide support to the military staff. (CONS-10, CONS-25, CONS-29)	Environmental Supervisor has managed the program for 24 years but unable to keep up. Contracted Natural Resource Manager hired in 2012.
		1.1.2: Coordinate INRMP revisions and implementation with Camp Ravenna operations, range control, and maintenance staffs. (CONS-28)	Recurring coordination of INRMP implementation with Camp Ravenna staff. Difficult at times due to limited staff and heavy maintenance, site development, project and environmental workloads.
		1.1.3: Identify and comply with regulatory driven land use limitations associated with natural resources such as wetlands, federally listed threatened and endangered species, and others. (CONS-28)	Wetlands are the biggest natural resources issue impacting training and development of Camp Ravenna. Several wetland delineations completed with Ohio EPA and USACE coordination. One 401 wetland permit obtained from Ohio EPA and mitigation completed. One 404/401 wetland permit in progress. One wetland modification completed without a permit and wetland restoration contracted and in progress. Indiana bat is the second major issue with potential to impact operations and projects. The current INRMP strategy implementation is working well. Surface water management has also been an issue in the last few years. We are working with the Ohio EPA on storm water discharge issues form our Engineer Dig Site and in process of obtaining an Individual NPDES Permit. The training site staff has been very supportive of the ENV staff in correcting deficiencies and trying to be proactive in managing and preventing problems. Training activity and development siting is reviewed based on multiple factors to include mission requirements and minimizing environmental impact.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
	1.2: Continue to educate Camp Ravenna users regarding the natural resources at Camp Ravenna and their part in ensuring sustainable use of the site in perpetuity.	1.2.1: Update and produce copies of the existing environmental information booklet given out to soldiers who train at Camp Ravenna so that it is current, accurate, and useful in helping the OHARNG maintain sustainable training land. (ITAM-1)	Booklet was updated in-house, printed by an outside contractor, and is distributed to soldiers upon arrival.
2. Maintain and foster positive working relationships with the U. S. Fish and Wildlife Service, the ODNR DOW, and other federal, state and local natural resources management agencies and organizations for the benefit of the military mission, the natural resources being managed, and the citizens of Ohio and the nation.	2.1: Effectively communicate mission needs to cooperating agencies and solicit input/review on projects with the potential to impact natural resources, especially in areas of regulatory primacy. (CONS-28)		Annual reviews and Review for Operation and Effect completed in coordination with USFWS, Ohio DNR/DOW, and Camp Ravenna staff. ESA Sec 7 coordination completed with USFWS as required. Ohio DNR consulted for PCNs. Annual coordination with DOW on deer hunt and Youth turkey hunting (when available). Coordinate with DOW on bear sighting/ trapping, duck banding, otter survey, turkey survey, and aerial deer count. Also work with USACE and Ohio EPA regarding wetland issues.
	2.2: Provide copies of biological surveys to interested cooperating agencies.		2010 updated biological surveys provided to the Ohio DOW and the USFWS.
	2.3: Facilitate cooperative management programs and projects that are compatible with the military mission and within the capabilities of the Camp Ravenna staff. (CONS-28)		The annual public deer hunt is our main cooperative program. We also have a couple of youth turkey hunt days when possible. Due to training activity youth turkey hunts were not conducted in 2011 and 2012. Training activity is increasing so public access programs are becoming more difficult to facilitate. We cooperate with the DOW on other activities as described in 2.1 above.

Table B – 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
3. Monitor the condition of the natural resources and the implied impacts from training and the natural resources management program on the natural resources at Camp Ravenna.	3.1: Maintain current species inventories and other PLSs through periodic reoccurring surveys and inventories.	3.1.1: Conduct annual breeding bird surveys on established breeding bird routes. The survey will identify nesting birds at Camp Ravenna in accordance with established national BBS protocols and identify significant upward or downward trends in the breeding bird population. (CONS-1)	Annual Breeding bird surveys were conducted in 2008-2012, on established breeding bird routes. The surveys identified nesting birds at Camp Ravenna in accordance with established national breeding bird survey protocols and identified significant upward or downward trends in the breeding bird population. Additionally in 2010 the ODNR performed a basewide bird survey in 2010.
		3.1.2: Conduct a training site-wide survey for the endangered Indiana bat every five years. If the Indiana bat or any other federally listed species is found, consultation with the USFWS will begin and the survey schedule modified as appropriate. (CONS-14)	Bat Survey initiated in 2009 and completed in 2010, Survey report dated November 2010.
		3.1.3: Conduct inventories of bird, herptile, and Lepidoptera species every five years to update existing data and monitor ecosystem for changes. (CONS-15)	Surveys conducted in 2010. Monitoring of ecosystem changes is largely based on discussions with biologists doing the surveys. Most of them have been doing the surveys since the early 1990's. Observations by the Environmental staff also contribute to monitoring efforts. Based on observations there have been no negative ecosystem impacts in the last 5 years. Vegetation is changing – more forest and some very thick shrub habitat but plant and animal communities are generally more diverse and robust than the areas surrounding Camp Ravenna.
		3.1.4: Conduct inventories of plants, plant communities, mammals, bird, mollusks and crayfish, and fish species every ten years to update existing data and monitor ecosystem for changes. (CONS-15, CONS-16)	Surveys conducted in 2010. Plant Communities survey update eliminated due to lack of funding.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
4. Protect and maintain populations of rare plant and animal species on Camp Ravenna in compliance with Federal and State laws and regulations.	4.1: Avoid negative impacts to federally listed species and avoid/minimize impacts to State listed and otherwise rare species.	4.1.1: Review Camp Ravenna development plans and military training activities in light of biological survey data and site projects and training in locations that best meet mission needs, avoid negative impacts to federally listed species, and minimize impacts to state listed and other rare species. (CONS-15, CONS-16)	The Camp Ravenna Master Plan was completed in 2009. Environmental was a key component in Master Plan development. The Range Development Master is reviewed annually. Environmental was key in development of the range development plan and range siting as well and continues to be coordinated with as range construction and other construction and training projects are initiated. A record of environmental consideration (REC) is completed for each project as applicable.
		4.1.2: Implement a vegetation control plan that is effective at maintaining Camp Ravenna grounds and infrastructure and minimizes disturbance to nesting birds and other species. (SRM-1)	It has been difficult to implement the INRMP mowing plan due to internal staff communication issues. Timing of mowing expanse areas to avoid impacts on nesting birds has improved and the new Natural Resources Manager on staff should help us improve even more.
		4.1.3: Implement Camp Ravenna INRMP strategies to maintain large tracts of forest and other habitat types to maintain diversity. (Multiple CONS Project #s)	A few brush areas have been converted to grassland in the last 5 years and most of our grassland management areas established. Grassland management contracts were issued in 2010 and 2012. We are cooperating with the USFWS Lower Great Lakes Woodcock and Young Forest Initiative to retain selected areas as early successional forest. A contract for this project was let in 2012. The areas will be reviewed and re-cut every 5 to 10 years as necessary. Forestland acreage is by far our most abundant habitat. The acreage is steady to slightly increased. A few minor clearings were done but no large clearing projects were completed.
		4.1.4: When using controlled burns, only burn a portion of any given habitat type at a time in order retain certain Lepidoptera species that overwinter in the grass. (CONS-6, CONS-11, CONS-21)	No burns were completed since the last INRMP update. Grasslands were maintained by mowing. Due to lack of staff for proper oversight, most grasslands were mowed at the same time leaving little grassland standing during years mowing was done. Need to improve our mowing rotation for grassland areas to retain a steady amount of standing grass in winter.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
5. Sustain usable training lands and native natural resources by managing non-native and invasive species, vegetation and plant communities, and nuisance wildlife species.	5.1: Manage populations of invasive plant species where they hinder training and/or habitat management objectives.	5.1.1: Control purple loosestrife, multiflora rose, Russian olive, autumn olive, and other invasive / noxious weeds identified throughout the INRMP implementation period. (CONS-12)	Phragmites and Japanese Knotweed control in 2009 and 2010. Ailanthus and Japanese Knotweed control in 2012. Roadside invasive species survey in 2013 and second treatment in 2013. 2012 was the first year for implementation of a concerted effort to identify and control invasive plant species.
	5.2: Manage non-native and invasive insect species that pose a threat to forest resources.	5.2.1: Cooperate with the USFS forest insect and disease monitoring efforts.	USFS conducted annual aerial insect and disease defoliation surveys as their funding permitted. No defoliation problems were identified.
		5.2.2: Implement forest management strategies identified in the Camp Ravenna INRMP and manage for vigorous and diverse forest communities. (CONS-1, CONS-2, CONS-13)	Forest management activities to include timber stand improvement and timber harvests conducted as scheduled with the exception of no timber harvest in 2012 due to lack of staff. Forest management strategy is to utilize stand improvement treatments such as grapevine control, cull tree deadening and crop tree release to improve growing conditions and retain species diversity. Timber harvesting is mostly single tree and group selection and commercial crop tree release, which retain a fully stocked stand. Specific consideration is given to retain wildlife trees/habitat and to providing conditions for regeneration of shade mid-tolerant species. Most harvests are improvement cuts in stands that are not yet mature and regenerating. At some point in the future heavier cutting and the use of fire will be needed to encourage oak and shade intolerant species regeneration.
	5.3: Manage terrestrial vegetation to support training, encourage native plant communities, and prevent damage to training site facilities and infrastructure.	5.3.1: Develop an Integrated Wildland Fire Management Plan and conduct controlled burns for fuel reduction and grassland management on ranges and other grassland areas. (CONS-11, CONS-20, CONS-21)	Wildland Fire Management Plan completed in 2009 by the USFS via a NGB National Contract. The Wildland Fire Management Plan part of the INRMP by reference. The plan does not contain a good burning schedule. Funding available in 2013 to have the plan updated. Intend to update the plan and implement via contracts with TNC or MOA with Ohio DNR/DOF/DOW.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	Objective	Proposed Program/Project	Implementation Status
		5.3.2: Improve dismounted maneuver areas by managing grassland habitat and converting non-native grasslands to native grasses by mowing, burning, and seeding with native grasses. (CONS-6, CONS-20)	Brush has been cut and most of the grassland management areas established. Dismounted maneuver is limited because the soils are prone to rutting and surface water controls are needed. Dry season maneuver is possible. Still need to do some clearing in Training Area 33.
		5.3.3: Control vegetation around buildings, on railroad tracks, in power line rights-of-way, in road ditches, road surfaces, around mowing obstructions, in parking lots, under fence lines and fence line clear zones, and any other facility areas. (SRM-1)	The Camp Ravenna mowing staff and equipment are not adequate for vegetation control needs. Improvement is needed in designation and implementation of mowing priorities. Contracted herbicide applications were conducted in 2009, 2011 and 2012. Control of some areas has been obtained but require ongoing maintenance applications. The 2012 Ohio EPA General Permit for Surface Water Discharges from Pesticide Applications has impacted our ability to treat roadside ditches and made program administration more difficult. Vegetation control is coordinated with environmental but has been difficult to manage due to lack of staff and time.
	5.4: Manage the beaver population to prevent damage to training site facilities and infrastructure and to maintain the quality warm water habitats of Hinkley Creek, Sand Creek, and South Fork Eagle Creek.	5.4.1: Implement a beaver trapping/control program per the Camp Ravenna INRMP to remove beaver damaging roads, culverts, and other facilities and those damming the main channels of Hinkley Creek, Sand Creek, and South Fork Eagle Creek. Selectively trap beaver in other areas. (CONS-4)	Beaver trapping performed annually by member of the general public. Most problem areas eliminated but there are some recurring problems. Continuous management is required.
		5.4.2: Remove beaver dam material from culverts and bridges and keep the three main streams (Hinkley Creek, South Fork Eagle Creek, and Sand Creek) free from beaver dams so as not to degrade current high quality of stream habitats. Trap beaver during trapping season and remove dams mechanically as necessary. Remove debris in side channels only if damaging government facilities and/or impeding mission capability. (CONS-8)	In-house staff has removed a few problem dams within the range complex. Funding was available in 2012 for a contracted effort but due to lack of staff to develop the contract, the funds were diverted to another INRMP project.
	5.5: Manage other nuisance animals that negatively impact the ecosystem.	5.5.1: Control feral cats, pigeons, and other species in accordance with the OHARNG Installation Pest Management Plan. (CONS-8)	No special effort was required for nuisance animal control. Coyotes seems to have the feral cat and dog populations in check, although a few feral cats were seen in 2012.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
6. Manage wildlife resources in a manner compatible with the military mission and within the limits of the natural habitat.	6.1: Cooperatively manage wildlife resources with the ODOW.	6.1.1: Continue wood duck nest box program.	Implemented.
		6.1.2: Continue duck banding program.	Implemented.
		6:1.3: Continue turkey census and other census programs.	Implemented.
		6.1.4: Allow the release of captured and recovered wildlife.	Implemented.
	6.2: Provide opportunity for wildlife recreation to the public that is compatible with the military mission.	6.2.1: Continue controlled hunting, trapping, fishing, educational, and watchable wildlife activities. (CONS-4, CONS-5, CONS-7, CONS-18)	Programs continued annually 2008-2012.
	6.3: Maintain wildlife population without augmenting the habitat with artificial food plots.	6.3.1: Implement the Camp Ravenna INRMP management strategies to maintain diverse habitats and native plant communities capable of supporting wildlife populations. (Multiple CONS Project #s)	No artificial food plots established. Implemented strategies within INRMP to maintain native plant communities and wildlife populations.
7. Manage Camp Ravenna whitetail deer population in a manner that minimizes impacts on the military mission, is ecologically sustainable, provides for public hunting, and is in accordance with Army regulations and State law.	7.1: Census the deer herd.	7.1.1: Fund the ODOW to conduct a winter aerial census of Camp Ravenna deer herd. (CONS-17)	Aerial deer surveys conducted by ODOW 2008-2010. Survey not conducted in 2011 due to lack of suitable snow cover in February. 2012 survey pending. MOA with DNR/DOW developed to fund survey at up to $1,500/yr.
		7.1.2: Conduct a road side deer survey of Camp Ravenna the last two weeks in August each year to determine the ratio between bucks and does and does and fawns.	Selected Camp Ravenna staff conducted surveys.
		7.1.3: Conduct deer browse surveys in summer if warranted.	Not necessary to implement.
	7.2: Determine winter carrying capacity for whitetail deer at Camp Ravenna.	7.2.1: Using the Camp Ravenna Plant Communities Survey, vegetative field sampling, and scientific literature determine the winter carrying capacity of the Camp Ravenna deer herd. (CONS-19)	Utilizing generally accepted capacity of approximately 20-30 deer per square mile. More in-depth research pending funding. Would like to partner with a university and make this a graduate student project.
	7.3: Maintain the white-tailed deer population at or near carrying capacity and at a buck to doe	7.3.1: Use controlled public access hunting to manage the deer herd. (CONS-4)	Implemented IAW INRMP.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
	ratio close to 1:2 (acceptable ratio is dependent on population size) with a maximum of six hunters dates per year.	7.3.2: Determine and issue the number of antlerless only and either sex deer permits necessary to bring the herd down to winter carrying capacity within the available number of hunt days.	Implemented IAW INRMP.
		7.3.3: Manage deer hunt areas by maintaining signage, boundary markings, mowing parking areas, and mowing access lanes into hunt areas. (CONS-5)	Minimal effort expended on this due to lack of staff. Many signs are in poor condition and in need of replacement. Hunt parking areas usually are mowed incidental to roadside mowing but not all areas that require mowing are mowed. Access lanes through thick brush are not being mowed. Some funding was available for this but was used 100% for grassland habitat mowing due to lack of staff and inability to develop a scope of work and issue a contract.
		7.3.4: Manage the VE program to facilitate public access to Camp Ravenna for deer hunting.	Implemented IAW INRMP.
8. Manage forest resources to the benefit of the military mission, to perpetuate the ecosystem functions, to support regional ecosystem needs, and for the production of forest products.	8.1: Maintain current forest resource data.	8.1.1: Conduct a GIS-compatible forest inventory of Camp Ravenna. The work will include revising the existing GIS Forest Management Map and linking the new forest inventory data to this map. (CONS-13)	An inventory was completed in 2011, but the data is suspect. A GIS linked map could not be developed within the available project funding. The designation of forest stands, stand acreages, field data and resulting stand volume calculations are all suspect. The inventory is not considered a reliable source of information. The old forest inventory with growth projections and Cutting Unit designations will continue to be used and funding for a new forest inventory requested.
	8.2: Implement forest management strategies identified in the Camp Ravenna INRMP.	8.2.1: Conduct timber stand improvement. (CONS-2)	Implemented IAW INRMP.
		8.2.2: Conduct timber harvests. (CONS-2)	Implemented IAW INRMP with the exception that a timber harvest was not conducted in 2012 due to lack of staff.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	Objective	Proposed Program/Project	Implementation Status
		8.2.3: Conduct minor forest products sales.	Firewood permit and contract sales conducted in timber harvest areas, blow down areas and areas where trees are a hazard or maintenance concern. Intend to expand program to include biomass sales as markets are available and when such activities are needed to support the mission and/or implementation of the INRMP.
9. Manage wetlands and other surface waters in accordance applicable Federal, State, and local regulations and to protect water quality and ecological functions while facilitating the military mission.	9.1: Avoid wetland fills.	9.1.1: Conduct wetland delineations and ORAM determinations prior to new construction or other ground disturbing activities so projects can be designed to avoid wetlands. (CONS-23)	Delineations conducted on an as-needed basis for new projects. Including: Southern half of TTB and MRF Range delineations in 2010, South Dig Site McKibben Connector, MPMG, and CPQC delineations in 2011, and North Dig Site, TVMA, MPMG Range, CPQC and Fire and Maneuver Range delineations in 2012.
	9.2: Minimize and mitigate unavoidable wetland fills.	9.2.1: Obtain Section 404 wetland fill permits and Section 401 WQC prior to any fill. (CONS-24)	MRF/Zero Range permit in progress. Expect permit to be issued in 2013. Also working on a permit for the MPMG Range. Expect this permit to be issued in 2014. Failed to obtain permit for clearing of a grown over fence line that was cleared to upgrade the deteriorated/missing old fence from barbed wire to chain-linked, barbed wire topped fence.
		9.2.2: Implement the required wetland mitigation per the 404/401 permits. (CONS-24)	Mitigation is in progress. There are four wetland mitigation sites on Camp Ravenna. These sites are required to be maintained and retained as wetlands in perpetuity. This is normally done with conservation easements and/or deed restrictions. Such covenants cannot be placed on Army property. In order to protect these sites, they will be identified in an Appendix to the INRMP. A description will describe the mitigation and the associated wetland permit and site restrictions/ retention requirements. A map of each site will be included. The appendix will be updated as new mitigation sites are added or other updates are needed. The information will also be provided to the OHARNG Master Planner for insertion into the Camp Ravenna Master Plan.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
	9.3: Maintain healthy aquatic ecosystems in ponds.	9.3.1: Manage aquatic vegetation in ponds that support a fishery. (CONS-18)	Not implemented due to lack of staff.
		9.3.2: Repair damaged earthen dikes and dams and pond access roads. (CONS-7)	Not implemented due to lack of staff.
	9.4: Restore, enhance and create wetlands when possible and compatible with the military mission.	9.4.1: Cooperate with the ODOT with mutually beneficial wetland mitigation project at Camp Ravenna for transportation projects.	No request received from ODOT. Implementation not necessary.
		9.4.2: Encourage wetland protection and restoration in conjunction with the RVAAP environmental restoration and facilities demolition programs.	Implemented. Developed wetland mitigation in conjunction with cleanup up a of restoration sites. Coordinated wetland protection and stream restoration on a couple of other restoration sites.
		9.4.3: Encourage construction of wetlands as engineer training projects and in association with Camp Ravenna development projects.	The opportunity has not presented itself for implementation of this project/ strategy.
10. Manage soil to maintain productivity and prevent and repair erosion in accordance with State and Federal laws and regulations so that Camp Ravenna can support doctrinally required military training in perpetuity.	10.1: Conduct training and other activities in locations with soil most suitable for supporting the activity.	10.1.1: Reference the Camp Ravenna soil survey and soil suitability and limitations when siting training and other activities.	Implemented when possible. Most of the available training areas at Camp Ravenna are so poorly drained that we have to make do with what we have and implement BMP's to prevent/ minimize erosion and restore damage.
	10.2: Rehabilitate, repair, and maintain areas damaged by training and other activities.	10.2.1: Repair soil damage caused by off road vehicle traffic. (CONS-26)	The land rehabilitation program in ITAM is responsible for this. Due to limited staff, equipment and funding it has been difficult to repair damage. We have been trying to avoid damage by training within land/ soil capability as much as possible. Still there is some rutting in the TVMA and some project areas that will develop into wetlands if not repaired. Erosion is not generally bad because most of the Camp Ravenna soils are not highly erodible. We do have a major erosion management project in place for the Engineer Dig Site.
		10.2.2: Implement BMPs for stream crossings and operations within riparian areas. (CONS-26)	Streams are only crossed with vehicles at culvert, bridges, or other hardened crossing locations. Several culvert and bridges have been replaced or repaired and additional repairs/ replacements are underway and planned.

Table B - 1. Degree of Previous INRMP Implementation FY 2008-20012			
Goal	**Objective**	**Proposed Program/Project**	**Implementation Status**
		10.2.3: Stabilize and harden eroded stream banks of several streams where they exit the training site. (CONS-22)	Funding was available to initiate this project in FY12 but unable to be executed due to lack of staff.
		10.2.4: Maintain vegetative cover on soil and comply with Ohio NPDES storm water management requirements for construction projects and other activities that create bare ground. (CONS-26)	Implemented IAW INRMP and applicable NPDES permits.
		10.2.5: Maintain tank trails by filling and grading damaged roads, maintaining sedimentation ponds, repairing ditches as necessary, and using palliatives for dust control.	Implementation completed as needed.
11. Manage cultural resources on Camp Ravenna in accordance with State and Federal laws and regulations while implementing the natural resources management program.	11.1: Comply with Federal, State, and local laws and regulations pertaining to cultural resources found on the training site.	11.1.1: Conduct archeological surveys in support of timber harvests and other ground disturbing activities. (CONS-3)	Surveys completed on 576 acres in 2008, 388 acres in 2009, 560 acres in 2010, 388 acres in 2011, and 2012 in contract negotiation.
		11.1.2: Using the archaeological survey results, determine if any actions will impact resources eligible for listing in the NRHP. Modify projects to avoid impacts or mitigate the impacts in consultation with the SHPO. (CONS-3)	Implemented IAW NHPA. No impacts to historic resources.
12. Develop, maintain, and manage data regarding natural resources at Camp Ravenna through the use of GIS for efficient data storage, retrieval, analysis, and presentation.	12.1: Develop accurate and usable natural resources GIS data.	12.1.1: Incorporate existing breeding bird data, deer hunt data, and other natural resources data that exists only on paper or as non-GIS electronic data into GIS. (CONS-9)	GIS support has been minimal because the OHARNG GIS staff is in Columbus. None of the GIS data generated for wetland delineations, biological surveys or other natural resources projects/ programs is routinely and regularly integrated into the INRMP data base and the Natural Resources manager does not have visibility of the database. We are working to improve. New aerial photographs were provided by ARNG in 2010.
		12.1.2: Revise and consolidate existing GIS files as more current data becomes available and when analysis warrants. (CONS-9)	Revision and update will accompany 2012-2013 INRMP Review Process.

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APPENDIX C
RECORD OF ENVIRONMENTAL CONSIDERATION

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Enviro Tracking #:	ARNG ENVIRONMENTAL CHECKLIST	State ARNG
	Enter information in the yellow shaded areas.	OHARNG

PART A - PROJECT INFORMATION

1. PROJECT NAME:
Five Year Update of the Camp Ravenna Joint Military Training Center Integrated Natural Resources Management Plan (INRMP).

2. PROJECT NUMBER: (MILCON if applicable)	3. DATE PREPARED:
N/A	8-Dec-14

4. DESCRIPTION AND LOCATION OF THE PROJECT/PROPOSED ACTION:

a. Location (Include a detailed map, if applicable):
The proposed action is the five-year update to the CRJMTC INRMP. The Camp Ravenna Joint Military Training Center is located at 1438 State Route 534 SW, Newton Falls, Ohio 44444. Location and facility map attached.

b. Description:
The proposed action is the five-year update and implementation of the Camp Ravenna Joint Military Training Center INRMP. The basic management strategies set forth in the 2001 INRMP and carried through in the 2008 INRMP are not being changed. This proposed action is simply a continuation of current goals and objectives already stated and outlined in the 2001 INRMP. The most significant updates to this INRMP is the GIS mapping work that has been developed and improved. Other updates being implemented throughout the INRMP text include funding projections for various conservation projects, timber harvest and Timber Stand Improvement schedule, Hunting regulations and summary data from recent Planning Level Surveys (PLS). This INRMP update enables continued implementation of program goals and objectives and allow for continued support of the military mission and natural resources management needs.

- ☐ Training activities/areas
- ☐ Maintenance/repair/rehabilitation
- ☐ Innovative readiness training project
- ☐ Other (Explain):
- ☐ Construction
- ☐ Real estate action
- ☑ Natural resource management
- ☑ Environmental plans/surveys

d. Project size (acres): 21,683 (if applicable) Acres of new surface disturbance (proposed): 0 (if applicable)

5. START DATE of PROPOSED ACTION (dd-mmm-yy): 8-Dec-14 Note: This must be a future date.

6. PROGRAMMED FISCAL YEAR (if applicable):

7. END DATE (if applicable): 30-Sep-19

PART B - DECISION ANALYSIS GUIDE

To use a categorical exclusion, the project must satisfy the following three screening criteria: no segmentation, no exceptional circumstances and a qualifying categorical exclusion that covers the project. The following decision tree will guide the application and documentation of these three screening criteria. The criteria were extracted from 32 CFR Section 651.29 and represent the most common screening conditions experienced in the ARNG. NOTE: Each question in Part B must have an applicable block checked for concurrence with REC.

1. Is this action segmented (the scope of the action must include the consideration of connected, cumulative, and similar actions)?
☐ YES (go to #30) ☑ NO (go to #2)

2. Is there reasonable likelihood of significant environmental effects (direct, indirect,and cumulative)? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.
☐ YES (go to #30) ☑ NO (go to #3)

3. Is there a reasonable likelihood of significant effects on public health, safety or the environment? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.
☐ YES (go to #30) ☑ NO (go to #4)

4. Is there an imposition of uncertain or unique environmental risks? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.
☐ YES (go to #30) ☑ NO (go to #5)

5. Is the project of greater scope or size than is normal for the category of action? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.
☐ YES (go to #30) ☑ NO (go to #6)

6. Does the project introduce or employ unproven technology? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.
☐ YES (go to #30) ☑ NO (go to #7)

PART B - DECISION ANALYSIS (continued)

7. Will there be reportable releases of hazardous or toxic substances as specified in 40 CFR Part 302? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

☐ YES (go to #30) ☑ NO (go to #8)

8. If proposed action is in a non-attainment or maintenance area, will air emissions exceed de minimus levels or otherwise require a formal Clean Air Act (CAA) conformity determination? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

☐ YES (go to #30) ☑ NO (go to #9) ☐ N/A (go to #9)

9. Will the project have effects on the quality of the environment that are likely to be highly controversial? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

☐ YES (go to #30) ☑ NO (go to #10)

10. Will the project establish a precedent (or make decisions in principle) for future or subsequent actions that are reasonably likely to have future significant effects? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

☐ YES (go to #30) ☑ NO (go to #11)

11. Has federal funding been secured for the Innovative Readiness Training (IRT) project?

☑ N/A (go to #13) ☐ YES (go to #13) ☐ NO (go to #12)

12. NOTE: IRT projects not currently funded can secure approved NEPA documentation. However, once funding is secured State ARNG is required to coordinate with ARNG-ILE-T to complete natural and cultural surveys via proponent funding.

☐ CONFIRMED (go to #27)

13. Do you have a species list from the U.S. Fish and Wildlife Service that is less than 90 days old?

☑ YES (go to #14) Date of List: December 2014 ☑ NO (update species list return to #13)

14. In reviewing the species list, what determination was made by the State ARNG?

☐ No species present (go to #16)
☑ No affect (go to #16)
☐ May affect but not likely to adversely affect (go to #16)
☐ May affect likely to adversely affect (go to #15)

Date of USFWS concurrence:

15. Does an existing Biological Opinion cover the action?

☐ YES (go to #16) Date of BO: ☐ NO (go to #30)

16. Have the Endangered Species Act, Section 7 requirements been completed?

☑ YES (go to #17) Date of Documentation: 8 December 2014 ☐ NO (complete documentation, return to #16)

17. Does the project involve an undertaking to a building or structure that is 50 years of age or older?

☐ YES (go to #18) ☑ NO (go to #20)

18. Has the building or structure been surveyed for the National Register of Historic Places?

☐ YES (go to #19) ☐ NO (complete inventory, return to #18)

19. Is the building or structure eligible for or listed on the National Register of Historic Places?

☐ YES (go to #20) ☐ NO (go to #20)

20. Does the action involve ground disturbing activities?

☐ YES (go to #21) ☑ NO (go to #22)

21. Has an archaeological inventory or research been completed to determine if there are any archeological resources present?

☐ YES (go to #22) ☐ NO (complete inventory or conduct research, return to #21)

22. In reviewing the undertaking, under the National Historic Preservation Act (NHPA) (for both above and below ground resources), what determination was made by the State ARNG?

☑ No 106 undertaking; no additional consultation required under NHPA (go to question #27)
☐ No properties affected (go to #24) Date of SHPO Concurrence:
☐ No adverse effect (go to #24) Date of SHPO Concurrence:
☐ Adverse effect (go to #23)

23. Has the State ARNG addressed the adverse effect?

☐ YES (place date of MOA or existing PA and explanation of mitigation in box below, go to #24) ☐ NO (go to #30)

23a.

PART B - DECISION ANALYSIS (continued)

24. Per DoDI 4710.02 did the state ARNG determine that tribal consultation was necessary for this project?

☐ YES (go to #25) ☐ NO (Provide reason in this block 24a, go to #27)

24a.

25. Did the Tribes express an interest or respond with concerns about the project?

☐ YES (go to #26) ☑ NO (go to #27) Date of Documentation:

26. Has the State ARNG addressed the Tribal concerns?

☐ YES (place date of MOU or explanation of how State ARNG addressed tribal concerns in box below, go to #27)
☐ NO (address concerns, return to #26)

Complete only if additional documentation is required in question #26

26a.

27. Does the project involve an unresolved effect on areas having special designation or recognition such as those listed below? For any yes responses go to #30 otherwise go to #28. If any No response is a result of negotiated and/or previously resolved effects please describe resolution in box 27a below.

TYPE	Unresolved Effects?	TYPE	Unresolved Effects?
a. Prime/Unique Farmland	no	e. Wild/Scenic River	no
b. Wilderness Area/National Park	no	f. Coastal Zones	no
c. Sole-Source Aquifer	no	g. 100-year Floodplains	no
d. Wetlands	no	h. National Wildlife Refuges	no

27a. Per the mitigated FNSI for this project a wetland delineation is required and avoidance, minimization of impacts to wetland must be followed. A fill permit and mitigation are required for impacts that cannot be avoided. This project will require a wetland fill permit and mitigation.

28. Is this project addressed in a separate EA or EIS review?

☑ YES (complete table below; go to Part C, Determination) ☐ NO (go to #29)

Document Title:	Environmental Assessment of the RTLS INRMP
Lead Agency:	OHARNG & ARNG
Date of Decision Document:	9-Nov-01

29. Does the project meet at least one of the categorical exclusions listed in 32 CFR 651 App B?

☐ YES (complete table below; go to Part C, Determination) ☐ NO (go to #30)

List primary CAT EX code	
Descibe why CAT EX applies	

30. At this time your project has not met all the qualifications for using a categorical exclusion under 32 CFR 651. Unless the scope of the project is changed, it will require an Environmental Assessment or possibly an Environmental Impact Statement. If you feel this is in error, please call your NEPA Regional Manager to discuss. If needed, go to Part C Determination.

Additional Information (if needed):

PART C - DETERMINATION

On the basis of this initial evaluation, the following is appropriate:

- ☐ IAW 32 CFR 651 Appendix B, the proposed action qualifies for a Categorical Exclusion (CX) that does not require a Record of Environmental Consideration.
- ☑ A Record of Environmental Consideration (REC).
- ☐ An Environmental Assessment (EA).
- ☐ A Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS).

Signature of Proponent (Requester)	Environmental Program Manager
Mr. Brian P. Riley	CPT Steven M. Vicario
Printed Name of Proponent (Requester)	Printed Name of Env. Program Manager
5 JAN 2015	12 Jan 2015
Date Signed	Date Signed

Other concurrence (as needed):

Signature of Landowner	William E. Meade Signature of Commander
COL John P. Dernberger	LTC William E. Meade
Printed Name	Printed Name
13 Feb 15	20 Feb 2015
Date Signed	Date Signed
Signature of Construction & Facilities Officer	Signature of Plans & Operations Officer
COL Michael Ore	COL Robert C. Bramlish
Printed Name	Printed Name
13 FEB 2015	5 FEB 2015
Date Signed	Date Signed
Signature	Signature
Printed Name	Printed Name
Date Signed	Date Signed

Enviro Tracking #: 0	**ARNG Record of Environmental Consideration** Enter information in the yellow shaded areas.	**State ARNG** OHARNG

1. PROJECT NAME:

Five Year Update of the Camp Ravenna JMTC Integrated Natural Resources Management Plan.

2. PROJECT NUMBER: (MILCON if applicable)	3. DATE PREPARED:
NA	8-Dec-14

4. START DATE of PROPOSED ACTION (dd-mmm-yy): 8-Dec-14 Note: This must be a future date

5. PROGRAMMED FISCAL YEAR: 0

6. END DATE (if applicable): 30-Sep-19

7. DESCRIPTION AND LOCATION OF THE PROPOSED ACTION:

a. Location (Include a detailed map, if applicable):

The proposed action is the five-year update to the CRJMTC INRMP. The Camp Ravenna Joint Military Training Center is located at 1438 State Route 534 SW, Newton Falls, Ohio 44444. Location and facility map attached.

b. Description:

The proposed action is the Update of the Camp Ravenna Joint Military Training Center INRMP. The basic management strategies set forth in the 2001 INRMP and carried through the 2008 INRMP are not being changed. This proposed action is simply a continuation of current goals and objectives already stated and outlined in the 2001 INRMP. The most significant updates to this INRMP is the GIS mapping work that has been developed and improved. Other updates being implemented throughout the INRMP text include funding projections for various conservation projects, timber harvest and timber stand improvement schedule, hunting regulations and summary data from recent Planning Level Surveys (PLS). This INRMP update enables continued implementation of program goals and objectives and allows for continued support of the military mission and natural resources management needs.

8. CHOOSE **ONE** OF THE FOLLOWING:

☑ An existing environmental assessment* adequately covers the scope of this project. Attach FNSI if EA was completed by another federal agency (non-ARNG).
EA Date (dd-mmm-yy): 9-Nov-01 Lead Agency: ARNG

☐ An existing environmental impact statement* adequately covers the scope of this project.
EIS Date (dd-mmm-yy): Lead Agency:

☐ After reviewing the screening criteria and completing the ARNG environmental checklist, this project qualifies for a
Categorical Exclusion Code:
See 32 CFR 651 App. B
Categorical Exclusion Code:
See 32 CFR 651 App. B
Categorical Exclusion Code:
See 32 CFR 651 App. B

☐ This project is exempt from NEPA requirements under the provisions of:
Cite superseding law:

*Copies of the referenced EA or EIS can be found in the ARNG Environmental Office within each state.

9. REMARKS:

Signature of Proponent (Requester)	Environmental Program Manager
Mr. Brian P. Riley	CPT Steven M. Vicario
Printed Name of Proponent (Requester)	Printed Name of Env. Program Manager
5 JAN 2015	12 Jan 2015
Date Signed	Date Signed

Proponent Information:

10. Proponent:	Natural Resources Manager, OHARNG
11. Address:	1438 State Route 534 SW, Newton Falls, OH 44444
12. POC:	Brian P. Riley
13. Comm. Voice:	614-336-4564
14. Proponent POC e-mail:	brian.p.riley17.nfg@mail.mil

STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, Ohio 44444

CRJMTC-ENV 8 December 2014

MEMORANDUM FOR RECORD

SUBJECT: Endangered Species Act (ESA) Section 7 Review for Update to Integrated Natural Resources Management Plan (INRMP), Camp Ravenna Joint Military Training Center, Ohio.

1. The Ohio Army National Guard (OHARNG) at Camp Ravenna is preparing to update its existing Integrated Natural Resources Management Plan for the Camp Ravenna Joint Military Training Center (CRJMTC).

Camp Ravenna or CRJMTC is located in northeastern Ohio within Portage and Trumbull Counties, approximately three miles northeast of Ravenna, Ohio. Camp Ravenna consists of approximately 21,683 acres which the OHARNG is responsible for managing. The updated INRMP provides guidance on managing the natural resources while maintaining and enhancing training opportunities for the US armed forces and law enforcement.

INRMP Implementation is planned to continue over the next five years through 2019. Conservation projects outlined in the text and summarized in Table 18 are designed to promote and enhance native species habitat and diversity. Project implementation is conducted so as to not have any negative impacts on water quality or habitat at Camp Ravenna. Perhaps the single project that could have the most impact on habitat and species diversity are our annual timber harvests which are conducted in a manner that enhances forest health and vigor as evidenced by the presence of 87 state-listed species currently on site.

Recognizing the impacts that the conservation activities could have on the habitat of the Indiana bat (*Myotis sodalis*), as well as the potentially endangered northern long-eared bat (*Myosotis septentrionalis*), the OHARNG will continue to hire certified bat surveyors to conduct monitoring surveys at Camp Ravenna every five years. Adhering to this schedule which is also outlined in the INRMP we are seeking to update, our next bat survey will take place in 2015.

2. The U. S. Fish and Wildlife Service (USFWS) web listing of Federally listed species and critical habitat was reviewed on 22 April 2014. The list was compared to flora and fauna species survey report for Camp Ravenna. The project area was also reviewed for the presence critical habitat and state of Ohio listed species. To date, Camp Ravenna is home to 11 State Endangered,
8 Threatened, 23 State Special Interest, 34 State Species of Concern and 10 Potentially Threatened species.

3. The following is the list of federally listed species known to occur in Portage and Trumbull County, Ohio provided by the U.S. Fish and Wildlife Service (USFWS) Ecological Services Field Office in Columbus, Ohio. The presence of general habitat within the project area and federally designated critical habitat at Camp Ravenna has also been included.

Common Name	Scientific Name	Federal Status	Habitat within Project Area	Critical Habitat at Camp Ravenna	Determination
Indiana bat	*Myotis sodalis*	E	Yes	No	No Affect
Mitchell's satyr	*Pleurobema clava*	E	No	No	No Affect
Clubshell	*Pleurobema clava*	E	No	No	No Affect
Northern Monkshood	*Aconitum noveboracense*	T	No	No	No Affect
Eastern Massasauga	*Sistrurus catenatus*	C	No	No	No Affect
Northern Long-Eared Bat	*Myotis septentrionalis*	PE	Yes	No	No Affect

E = Endangered
T = Threatened
C = Candidate
PE = Proposed Endangered

4. Intensive biological surveys have been conducted at Camp Ravenna and are updated on a regular basis as agreed to by the USFWS in the Camp Ravenna INRMP. The latest bat, reptile, bird and mussel surveys were completed in 2010. Review of these surveys and past surveys show that only the bald eagle and northern long-eared bat is documented to exist at Camp Ravenna.

5. There is general habitat suitable for the Indiana bat within the area described within the proposed action. Management of the Indiana bat and northern long-eared bat in regard to timber harvesting and tree cutting is specifically addressed in the updated Camp Ravenna INRMP, Section 6.8.9.3. The USFWS agreed in said INRMP that base-wide bat surveys conducted every five years are sufficient to determine the presence or absence of the Indiana bat and northern long-eared bat and project specific surveys are not required so long as trees greater than three (3) inches in diameter are cut between 1 October and 31 March. The OHARNG intends to follow this guidance issued by the USFWS. Furthermore, the OHARNG follows

guidance from the USFWS on Bald Eagle Management. The nesting pair of bald eagles will in no way be impacted by any conservation activity outlined in said INRMP.

6. Based on the above review, while the Proposed Endangered northern long-eared bat occurs on site, there have been no Federally Threatened or Endangered species found at CRJMTC nor is there any federally designated critical habitat and because the OHARNG intends to follow all guidance on season cutting restrictions set forth by the USFWS, the OHARNG has determined that updating our own Integrated Natural Resources Management Plan (INRMP) implementation of the proposed conservation projects (proposed actions) set forth in Updated Camp Ravenna INRMP will have **no affect** on any federally listed species or its preferred habitat.

7. The POC for this action is Mr. Brian Riley, Natural Resources Manager, OHARNG, at 614-336-4564 or brian.p.riley17.nfg@mail.mil.

//////////////BPR//////////////
BRIAN P. RILEY
Natural Resources Manager
OHARNG-ENV

CC: CRJMTC – ENV file

APPENDIX D
FLORA AND FAUNA SPECIES

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TABLE OF CONTENTS

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CAMP RAVENNA – DIVISION BRYOPHYTA (LIVERWORTS)			
CLASS – HEPATICAE (LIVERWORTS)			
Taxa	Species Status	Taxa	Species Status
Calypogeja integristipula Steph.	-	*Geocalyx graveolens* (Schrad.) Nees	-
Calypogeja muelleriana (Schiffn.) K. Meull.	-	*Kurzia sylvatica* (Evans) Grolle	-
Cephalozia connivens (Dicks.) Lindb.	-	*Lophocolea heterophylla* (Schrad.) Dum.	-
Cephalozia pleniceps (Aust.) Lindb.	-	*Nowellia curvifolia* (Dicks.) Mitt.	-
Cephaloziella hampeana (Schrad.) Dum.	-	*Pallavicinia lyellii* (Hook.) Carruth.	-
Cephaloziella rubella (Nees) Warnst.	-	*Pellia epiphylla* (L.) Corda	-
Conocephalum conicum (L.) Lindb.	-	*Ptilidium pulcherrimum* (Web.) Hampe	-
Diplophyllum apiculatum (Evans) Steph.	-	*Riccia fluitans* L.	-
Fossombronia foveolata Lindb.	-	*Scapania nemorea* (L.) Grolle	-
Frullania eboracensis Gott.	-	*Solenstoma crenuliforme* (Aust.) Steph.	-

CAMP RAVENNA – DIVISION BRYOPHYTA (MOSSES)			
CLASS – MUSCI (MOSSES)			
Taxa	Species Status	Taxa	Species Status
Amblystegium varium (Hedw.) Lindb.	-	*Helodium paludosum* (Sull.) Aust.	-
Anomodon attenuatus (Hedw.) Htib.	-	*Herzogiella striatella* (Brid.) Iwats.	-
Anomodon rostratus (Hedw.) Schimp.	-	*Homomallium adnatum* (Hedw.) Broth.	-
Archidium ohioense Schimp. ex C Mtill.	-	*Hygroamblystegium tenax* Hedw. var. *tenax*	-
Atrichum angustatum (Brid.) Bruch & Schimp. in B.S.G.	-	*Hygrohypnum luridum* (Hedw.) J enn.	-
Atrichum oerstedianum (c. Miill.) Mitt.	-	*Hypnum curvifolium* Hedw.	-
Aulacomnium palustre (Hedw.) Schwaegr.	-	*Hypnum imponens* Hedw.	-
Barbula unguiculata Hedw.	-	*Hypnum lindbergii* Mitt.	-
Brachythecium acuminatum (Hedw.) Aust.	-	*Hypnum pallescens* (Hedw.) P. Beauv. var. *pallescens*	-
Brachythecium campestre (Mull.) Schimp. in B.S.G.	-	*Isopterygium tenerum* (Sw.) Mitt.	-
Brachythecium oxycladon (Brid.) Jaeg.	-	*Leptodictyum riparium* (Hedw.) Warnst.	-
Brachythecium rivulare Schimp. in B.S.G.	-	*Leskea gracilescens* Hedw.	-
Brachythecium rutabulum (Hedw.) Schimp. in B.S.G.	-	*Leucobryum albidum* (Brid. Ex P. Beauv.) Lindb.	-
Brachythecium salebrosum (Web. & Mohr.) Schimp. in B.S.G. var. *salebrosum*	-	*Leucobryum glaucum* (Hedw.) Angstr. Ex Fries	-
Brotherella recurvans (Michx.) Fleisch.		*Limprichtia cossonii* (Schimp.) Anderson et al.	-
Bryhnia novae-angliae (Sull. & Lesq. in Sull.) Grout	-	*Mnium hornum* Hedw.	-
Bryoandersonia illecebra (Hedw.) Robins.	-	*Orthotrichum anomalum* Hedw.	-
Bryoxiphium norvegicum (Brid.) Mitt.	-	*Orthotrichum pumilum* Sw.	-
Bryum argenteum Hedw.	-	*Orthotrichum pusillum* Mitt.	-
Bryum caespiticium Hedw.	-	*Philonotis fontana* (Hedw.) Brid. var. *caespitosa* (lur.) Schimp.	E
Bryum capillare Hedw. var. *capillare*	-	*Physcomitrium pyriforme* (Hedw.) Hampe.	-
Bryum lisae De Not. var. *cuspidatum* (Bruch & Schimp. in B.S.G.) Marg.	-	*Plagiomnium ciliare* (C, MUll.) T. Kop.	-
Bryum pseudotriquetrum (Hedw.) Gaertn., Meyer, & Scherb.	-	*Plagiomnium cuspidatum* (Hedw.) T. Kop.	-
Callicladium haldanianum (Grev.) Crum	-	*Plagiothecium cavifoum* (Hedw.) Iwats.	-

CAMP RAVENNA – DIVISION BRYOPHYTA (MOSSES)			
CLASS – MUSCI (MOSSES)			
Taxa	Species Status	Taxa	Species Status
Calliergon cordifolium (Hedw.) Kindb.	-	*Plagiothecium denticulatum* (Hedw.) Schimp. in B.S.G.	-
Calliergonella cuspidata (Hedw.) Loeske	-	*Plagiothecium laetum* Schimp. in B.S.G.	-
Campylium chrysophyllum (Brid.) J. Lange	-	*Plagiothecium latebricola* Schimp. in B.S.G.	T
Campylium stellatum (Hedw.) C. Jens. var. stellatum	-	*Platygyrium repens* (Brid.) Schimp. in B.S.G.	-
Ceratodon purpureus (Hedw.) Brid. var. purpureus	-	*Platyhypnidium riparioides* (Hedw.) Dix.	-
Climacium americanum Brid.	-	*Pleurozium schreberi* (Brid.) Mitt.	-
Climacium kindbergii (Ren. & Card.) *GroutCratoneuron filicinum* (Hedw.) Spruce	-	*Pogonatum pensilvanicum* (Hedw.) P. Beauv.	-
Ctenidium malacodes Mitt.		*Pohlia elongata* Hedw. var. *elongata*	E
Desmatodon porteri James in Aust.	-	*Pohlia nutans* (Hedw.) Lindb.	-
Dicranella heteromalla (Hedw.) Schimp.	-	*Pohlia wahlenbergii* (Web. & Mohr) Andrews	-
Dicranella varia (Hedw.) Schimp.	-	*Polytrichum commune* Hedw. var. *commune*	-
Dicranodontium denudatum (Brid.) E.G. Britt. in Williams	-	*Polytrichum ohioense* Ren. & Card.	-
Dicranum flagellare Hedw.	-	*Polytrichum piliferum* Hedw.	-
Dicranum fulvum Hook.	-	*Pseudotaxiphyllum distichaceum* (Mitt.) Iwats	-
Dicranum montanum Hedw.	-	*Pseudotaxiphyllum elegans* (Brid.) Iwats.	-
Dicranum polysetum Sw.	-	*Rhabdoweisia crispata* (With.) Lindb.	-
Dicranum scoparium Hedw.	-	*Rhizomnium punctatum* (Hedw.) T. Kop. var. *punctatum*	-
Dicranum viride (Sull. & Lesq. in Sull.) Lindb.	-	*Rhodobryum roseum* (Hedw.) Limpr.	-
Diphysciumjoliosum (Hedw.) Mohr	-	*Schistidium rivulare* (Brid.) Podp. var. *rivulare*	-
Ditrichum pallidum (Hedw.) Hampe	-	*Sematophyllum adnatum* (Michx.) Britt.	-
Drepanocladus aduncus (Hedw.) Warnst. var. *aduncus*	-	*Sphagnum capillifoUum* (Ehrh.) Hedw. var. *capillifoUum*	-
Entodon cladorrhizans (Hedw.) C. MUll.	-	*Sphagnumfallax* (Klinggr.) Klinggr.	-
Entodon seductrix (Hedw.) C. Mtill.	-	*Sphagnum fimbriatum* Wils. in Wils. & Hook f. in Hook. f. var. *fimbriatum*	-
Eurhynchium hians (Hedw.) Sande Lac.	-	*Sphagnumfuscum* (Schimp.) Klinggr.	-
Fissidens adianthoides Hedw.	-	*Sphagnum girgensohnii* Ross.	-
Fissidens bryoides Hedw.	-	*Sphagnum lescurii* Sullo in Gray	-
Fissidens dubius P. Beauv.	-	*Sphagnum magellanicum* Brid.	-
Fissidens ravenelii Sullo	-	*Sphagnum palustre* L.	-
Fissidens taxifolius Hedw.	-	*Sphagnum russowii* Warnst.	-
Fontanalis dalecarlica Schimp. in B.S.G.	-	*Sphagnum squarrosum* Crome	-
Fontinalis novae-angliae Sullo var. *novae-angliae*	-	*Steerecleus serrulatus* (Hedw.) Robins.	-
Funaria hygrometrica Hedw.	-	*Taxiphyllum deplanatum* (Bruch & Schimp. in Sull.) Fleisch.	-
Gymnostomum aeruginosum Sm.	-	*Tetraphis pellucid* a Hedw.	-
Haplocladium virginianum (Brid.) Broth.	-	*Thamnobryum alleghaniense* (c. Mull.) Nieuwl.	-
Hedwigia ciliata (Hedw.) P. Beauv.	-	*Thuidium delicatulum* (Hedw.) Schimp. in B.S.G.	-
Helodium blandowii (Web. & Mohr) Warnst. var. blandowii	-	*Tortella humilis* (Hedw.) lenn.	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Aceraceae	*Acer negundo* var. *negundo*	Box-elder	-	Dicotyledons	-
Aceraceae	*Acer rubrum* var. *rubrum*	Red maple	-	Dicotyledons	-
Aceraceae	*Acer platanoides*	Norway maple	*	Dicotyledons	-
Aceraceae	*Acer saccharinum*	Silver maple	-	Dicotyledons	-
Aceraceae	*Acer saccharum*	Sugar maple	-	Dicotyledons	-
Aceraceae	*Acer saccharum* var. *viride*	Black maple	-	Dicotyledons	-
Aceraceae	*Acer spicatum*	Mountain maple	-	Dicotyledons	-
Aceraceae	*Acer* x *freemanii*	Freeman maple	-	Dicotyledons	-
Acoraceae	*Acorus calamus*	Sweet flag	-	Monocotyledons	-
Adiantaceae	*Adiantum pedatum*	Maidenhair fern	-	Pteridophytes	-
Adoxaceae	*Sambucus canadensis*	Elderberry	-	Dicotyledons	-
Adoxaceae	*Sambucus pubens*	Red-berried elderberry	-	Dicotyledons	-
Adoxaceae	*Viburnum acerfolium*	Maple-leaved viburnum	-	Dicotyledons	-
Adoxaceae	*Viburnum alnifolium*	Hobblebush	-	Dicotyledons	T
Adoxaceae	*Viburnum lentago*	Nannyberry	-	Dicotyledons	-
Adoxaceae	*Viburnum opulus* var *opulus*	European cranberry-bush	*	Dicotyledons	-
Adoxaceae	*Viburnum plicatum*	Japanese snow-ball	*	Dicotyledons	-
Adoxaceae	*Viburnum prunifolium*	Black haw	-	Dicotyledons	-
Adoxaceae	*Viburnum recognitum*	Northern arrow-wood	-	Dicotyledons	-
Alismataceae	*Alisma subcordatum*	Southern water-plantain	-	Monocotyledons	-
Alismataceae	*Sagittaria latifolia* var. *latifolia*	Common arrow-head	-	Monocotyledons	-
Alliaceae (Liliaceae)	*Allium burdickii*	Narrowleaf wild leak	-	Monocotyledons	-
Alliaceae (Liliaceae)	*Allium canadense*	Wild onion	-	Monocotyledons	-
Alliaceae (Liliaceae)	*Allium sativum*	Garlic	*	Monocotyledons	-
Alliaceae (Liliaceae)	*Allium vineale*	Field garlic	*	Monocotyledons	-
Amaranthaceae	*Amaranthus albus*	Tumbleweed	-	Dicotyledons	-
Amaranthaceae	*Amaranthus retroflexus*	Red root	-	Dicotyledons	-
Amaryllidaceae (Liliaceae)	*Narcissus poeticus*	Poet's narcissus	*	Monocotyledons	-
Amaryllidaceae (Liliaceae)	*Narcissus pseudonarcissus*	Daffodil	*	Monocotyledons	-
Anacardiaceae	*Rhus copallina* var. *latifolia*	Shining sumac	-	Dicotyledons	-
Anacardiaceae	*Rhus glabra*	Smooth sumac	-	Dicotyledons	-
Anacardiaceae	*Rhus typhina*	Stag horn sumac	-	Dicotyledons	-
Anacardiaceae	*Toxicodendron radicans*	Poison-ivy	-	Dicotyledons	-
Anacardiaceae	*Toxicodendron vernix*	Poison sumac	-	Dicotyledons	-
Annonaceae	*Asimina triloba*	Pawpaw	-	Dicotyledons	-
Apiaceae	*Cicuta bulbifera*	Bulblet-bearing water-hemlock	-	Dicotyledons	-
Apiaceae	*Cicuta maculata*	Water-hemlock	-	Dicotyledons	-
Apiaceae	*Cryptotaenia canadensis*	Honewort	-	Dicotyledons	-
Apiaceae	*Daucus carota*	Queen Anne's lace	*	Dicotyledons	-
Apiaceae	*Erigenia bulbosa*	Harbinger of spring		Dicotyledons	-
Apiaceae	*Pastinaca sativa*	Wild parsnip	*	Dicotyledons	-
Apiaceae	*Sanicula canadensis*	Short-styled snakeroot	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Apiaceae	*Sium suave*	Water-parsnip	-	Dicotyledons	-
Apiaceae	*Torilis japonica*	Japanese hedge-parsely	*	Dicotyledons	-
Apocynaceae	*Apocynum androsaemifolium*	Spreading dogbane	-	Dicotyledons	-
Apocynaceae	*Apocynum cannabinum*	Indian hemp	-	Dicotyledons	-
Apocynaceae	*Apocynum* x *flordinanum*	Intermediate dogbane	-	Dicotyledons	-
Apocynaceae	*Vinca minor*	Periwinkle	*	Dicotyledons	-
Aquifoliaceae	*Ilex opaca*	American holly	*	Dicotyledons	-
Aquifoliaceae	*Ilex verticillata*	Winterberry	-	Dicotyledons	-
Araceae	*Arisaema dracontinum*	Green dragon	-	Monocotyledons	-
Araceae	*Arisaema triphyllum* var. *stewardsonii*	Jack-in-the-pulpit	-	Monocotyledons	-
Araceae	*Arisaema triphyllum* var. *triphyllum*	Jack-in-the-pulpit	-	Monocotyledons	-
Araceae	*Symplocarpus foetidus*	Skunk cabbage	-	Monocotyledons	-
Araceae (Lemnaceae)	*Lemna minor*	Common duckweed	-	Monocotyledons	-
Araceae (Lemnaceae)	*Spirodela polyrhiza*	Greater duckweed	-	Monocotyledons	-
Araceae (Lemnaceae)	*Wolffia columbiana*	Common water-meal	-	Monocotyledons	-
Araceae (Lemnaceae)	*Wolffia papulifera*	Pointed water-meal	-	Monocotyledons	-
Araceae (Lemnaceae)	*Wolfia punctata*	Water-meal	-	Monocotyledons	-
Araliaceae	*Aralia nudicaulis*	Wild sarsaparilla	-	Dicotyledons	-
Araliaceae	*Aralia racemosa*	Spikenard	-	Dicotyledons	-
Araliaceae	*Hedera helix*	English ivy	*	Dicotyledons	-
Araliaceae	*Panax quinquefolius*	American ginseng	-	Dicotyledons	-
Araliaceae	*Panax trifolius*	Dwarf ginseng	-	Dicotyledons	-
Aristolochiaceae	*Asarum canadense*	Wild-ginger	-	Dicotyledons	-
Asclepiadaceae	*Asclepias incarnata*	Swamp milkweed	-	Dicotyledons	-
Asclepiadaceae	*Asclepias syriaca*	Common milkweed	-	Dicotyledons	-
Asclepiadaceae	*Asclepias tuberosa*	Butterfly-weed	-	Dicotyledons	-
Asclepiadaceae	*Asclepias verticillata*	Whorled milkweed	-	Dicotyledons	-
Asparagaceae (Liliaceae)	*Asparagus officinalis*	Garden asparagus	*	Monocotyledons	-
Aspleniaceae	*Asplenium platyneuron*	Ebony-spleenwort	-	Pteridophytes	-
Asteraceae	*Achillea millefolium* ssp. *lanulosa*	Common yarrow	-	Dicotyledons	-
Asteraceae	*Ageratina altissima*	White snakeroot	-	Dicotyledons	-
Asteraceae	*Ambrosia artemisiifolia*	Common ragweed	-	Dicotyledons	-
Asteraceae	*Antennaria neglecta* var. *neglecta*	Field-pussytoes	-	Dicotyledons	-
Asteraceae	*Antennaria plantaginifolia* var. *ambigens*	Plantain-pussy toes	-	Dicotyledons	-
Asteraceae	*Anthemis cotula*	Mayweed	*	Dicotyledons	-
Asteraceae	*Arctium lappa*	Great burdock	*	Dicotyledons	-
Asteraceae	*Arctium minus*	Common burdock	*	Dicotyledons	-
Asteraceae	*Artemisia ludoviciana*	White sage	*	Dicotyledons	-
Asteraceae	*Artemisia vulgaris*	Common mugwort	*	Dicotyledons	-
Asteraceae	*Bidens aristosa*	Midwestern tickseed-sunflower	-	Dicotyledons	-
Asteraceae	*Bidens cernua*	Bur-marigold	-	Dicotyledons	-
Asteraceae	*Bidens coronata*	Northern tickseed-sunflower	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Asteraceae	*Bidens discoidea*	Few-bracted beggar-ticks	-	Dicotyledons	-
Asteraceae	*Bidens frondosa*	Devil's beggar-ticks	-	Dicotyledons	-
Asteraceae	*Bidens tripartita*	Purplestem beggar-ticks	-	Dicotyledons	-
Asteraceae	*Centaurea jacea*	Brown knapweed	*	Dicotyledons	-
Asteraceae	*Centaurea stoebe*	Spotted knapweed	*	Dicotyledons	-
Asteraceae	*Cichorium intybus*	Chickory	*	Dicotyledons	-
Asteraceae	*Cirsium arvense*	Canada-thistle	*	Dicotyledons	-
Asteraceae	*Cirsium muticum*	Swamp thistle	-	Dicotyledons	-
Asteraceae	*Cirsium pumilum*	Pasture thistle	-	Dicotyledons	-
Asteraceae	*Cirsium vulgare*	Bull thistle	*	Dicotyledons	-
Asteraceae	*Conyza canadensis* var. *canadensis*	Horseweed	-	Dicotyledons	-
Asteraceae	*Doellingeria umbellata*	Tall flat-topped aster	-	Dicotyledons	-
Asteraceae	*Erechites hieraciifolia*	Fireweed	-	Dicotyledons	-
Asteraceae	*Erigeron annuus*	Daisy fleabane	-	Dicotyledons	-
Asteraceae	*Erigeron philadelphicus*	Philadelphia fleabane	-	Dicotyledons	-
Asteraceae	*Erigeron strigosus*	Rough fleabane	-	Dicotyledons	-
Asteraceae	*Eupatorium altissimum*	Tall thoroughwort	-	Dicotyledons	-
Asteraceae	*Eupatorium perfoliatum* var. *perfoliatum*	Boneset	-	Dicotyledons	-
Asteraceae	*Eupatorium serotinum*	Lateflowering boneset	-	Dicotyledons	-
Asteraceae	*Eupatorium x truncatum*	Truncate-leaved boneset	-	Dicotyledons	-
Asteraceae	*Eurybia macrophylla*	Large-leaved aster	-	Dicotyledons	-
Asteraceae	*Eurybia schreberi*	Schreber's aster	-	Dicotyledons	-
Asteraceae	*Euthamia graminifolia* var. *graminifolia*	Common flat-topped goldenrod	-	Dicotyledons	-
Asteraceae	*Eutrochium fistulosum*	Hollow-stemmed joe-pye weed	-	Dicotyledons	-
Asteraceae	*Eutrochium maculatum* ssp. *maculatum*	Spotted joe-pye weed	-	Dicotyledons	-
Asteraceae	*Gnaphalium uliginosum*	Low cudweed	-	Dicotyledons	-
Asteraceae	*Helenium autumnale*	Common sneezeweed	-	Dicotyledons	-
Asteraceae	*Helenium flexuosum*	Southern sneezeweed	*	Dicotyledons	-
Asteraceae	*Helianthus decapetalus*	Forest-sunflower	-	Dicotyledons	-
Asteraceae	*Helianthus grosseserratus*	Sawtooth sunflower	-	Dicotyledons	-
Asteraceae	*Helianthus tuberosa*	Jerusalem-artichoke	-	Dicotyledons	-
Asteraceae	*Heliopsis helianthoides* var. *helianthoides*	Ox-eye sunflower	-	Dicotyledons	-
Asteraceae	*Hieracium aurantiacum*	Devil's paint-brush	*	Dicotyledons	-
Asteraceae	*Hieracium caespitosum*	Yellow king-devil	*	Dicotyledons	-
Asteraceae	*Hieracium gronovii*	Beaked hawkweed	-	Dicotyledons	-
Asteraceae	*Hieracium paniculatum*	Panicled hawkweed	-	Dicotyledons	-
Asteraceae	*Hieracium pilosella*	Mouse-ear hawkweed	*	Dicotyledons	-
Asteraceae	*Hieracium piloselloides*	Glaucous king devil	*	Dicotyledons	-
Asteraceae	*Hieracium scabrum*	Sticky hawkweed	-	Dicotyledons	-
Asteraceae	*Hieracium venosum*	Veined hawkweed	-	Dicotyledons	-
Asteraceae	*Hypochaeris radicata*	Spotted cat's ear	-	Dicotyledons	-
Asteraceae	*Inula helenium*	Elecampane	*	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Asteraceae	*Lactuca biennis*	Tall blue lettuce	-	Dicotyledons	-
Asteraceae	*Lactuca canadensis* var. *latifolia*	Wild lettuce	-	Dicotyledons	-
Asteraceae	*Lactuca floridana*	woodland lettuce	-	Dicotyledons	-
Asteraceae	*Lactuca saligna*	Willowleaf-lettuce	*	Dicotyledons	-
Asteraceae	*Lactuca serriola* var. *integrata*	Prickly lettuce	*	Dicotyledons	-
Asteraceae	*Leontodon hispidus*	Common hawkbit	*	Dicotyledons	-
Asteraceae	*Leucanthemum vulgare*	Ox-eye daisy	*	Dicotyledons	-
Asteraceae	*Matricaria discoidea*	Pineapple-weed	*	Dicotyledons	-
Asteraceae	*Packera aurea*	Golden ragwort	-	Dicotyledons	-
Asteraceae	*Packera obovata*	Roundleaf squaw-weed	-	Dicotyledons	-
Asteraceae	*Prenanthes altissima* var. *altissima*	Tall white lettuce	-	Dicotyledons	-
Asteraceae	*Prenanthes crepidinea*	Nodding rattlesnake-root	-	Dicotyledons	-
Asteraceae	*Pseudognaphalium obtusifolium*	Fragrant cudweed	-	Dicotyledons	-
Asteraceae	*Rudbeckia fulgida*	Eastern coneflower	-	Dicotyledons	-
Asteraceae	*Rudbeckia hirta* var. *pulcherrima*	Black-eyed Susan	-	Dicotyledons	-
Asteraceae	*Rudbeckia laciniata* var. *laciniata*	Cutleaf-coneflower	-	Dicotyledons	-
Asteraceae	*Rudbeckia triloba* var. *triloba*	Three-lobed coneflower	-	Dicotyledons	-
Asteraceae	*Senecio vulgaris*	Common groundsel	*	Dicotyledons	-
Asteraceae	*Solidago bicolor*	Silver-rod	-	Dicotyledons	-
Asteraceae	*Solidago caesia*	Blue-stem goldenrod	-	Dicotyledons	-
Asteraceae	*Solidago canadensis var. scabra*	Canada goldenrod	-	Dicotyledons	-
Asteraceae	*Solidago flexicaulis*	Zigzag goldenrod	-	Dicotyledons	-
Asteraceae	*Solidago gigantea*	Smooth goldenrod	-	Dicotyledons	-
Asteraceae	*Solidago juncea*	Early goldenrod	-	Dicotyledons	-
Asteraceae	*Solidago nemoralis* var. *nemoralis*	Gray goldenrod	-	Dicotyledons	-
Asteraceae	*Solidago patula* var. *patula*	Rough-leaved goldenrod	-	Dicotyledons	-
Asteraceae	*Solidago rugosa* var. *rugosa*	Wrinkle-leaved goldenrod	-	Dicotyledons	-
Asteraceae	*Sonchus arvensis* var. *glabrescens*	Field sow-thistle	*	Dicotyledons	-
Asteraceae	*Sonchus asper*	Prickly sow-thistle	*	Dicotyledons	-
Asteraceae	*Sonchus oleraceus*	Common sow-thisle	*	Dicotyledons	-
Asteraceae	*Symphyotrichum ciliatum*	Rayless alkali aster	*	Dicotyledons	-
Asteraceae	*Symphyotrichum cordifolium*	Common heart-leaved aster	-	Dicotyledons	-
Asteraceae	*Symphyotrichum divaricatum var. divaricatum*	Common white heart-leaved aster	-	Dicotyledons	-
Asteraceae	*Symphyotrichum firmum*	Shining aster	-	Dicotyledons	-
Asteraceae	*Symphyotrichum lanceolatum* var. *lanceolatum*	Eastern lined aster	-	Dicotyledons	-
Asteraceae	*Symphyotrichum lateriflorum*	Calico aster	-	Dicotyledons	-
Asteraceae	*Symphyotrichum novae-angliae*	New England aster	-	Dicotyledons	-
Asteraceae	*Symphyotrichum pilosum* var. *pilosum*	Common white aster	-	Dicotyledons	-
Asteraceae	*Symphyotrichum praealtum* var. *praealtum*	Veiny lined aster	-	Dicotyledons	-
Asteraceae	*Symphyotrichum prenanthoides*	Zigzag aster	-	Dicotyledons	-
Asteraceae	*Symphyotrichum puniceum*	Bristly aster	-	Dicotyledons	-
Asteraceae	*Symphyotrichum racemosum*	Small-headed aster	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Asteraceae	*Symphyotrichum urophllum*	White arrow-leaved aster	-	Dicotyledons	-
Asteraceae	*Taraxacum officinale*	Common dandelion	*	Dicotyledons	-
Asteraceae	*Tragopogon dubius*	Fistulous goat's-beard	*	Dicotyledons	-
Asteraceae	*Tragopogon porrifolius*	Oyster-plant	*	Dicotyledons	-
Asteraceae	*Tragopogon pratensis*	Showy goat's-beard	*	Dicotyledons	-
Asteraceae	*Tussilago farfara*	Coltsfoot	*	Dicotyledons	-
Asteraceae	*Verbesina alternifolia*	Wingstem	-	Dicotyledons	-
Asteraceae	*Vernonia gigantea* var. *gigantea*	Tall ironweed	-	Dicotyledons	-
Asteraceae	*Xanthium strumarium* var. *glabratum*	Common cocklebur	-	Dicotyledons	-
Balsaminaceae	*Impatiens capensis*	Orange touch-me-not	-	Dicotyledons	-
Balsaminaceae	*Impatiens pallida*	Yellow touch-me-not	-	Dicotyledons	-
Berberidaceae	*Berberis thunbergii*	Japanese barberry	*	Dicotyledons	-
Berberidaceae	*Caulophyllum thalictroides*	Blue cohosh	-	Dicotyledons	-
Berberidaceae	*Podophyllum peltatum*	May-apple	-	Dicotyledons	-
Betulaceae	*Alnus incana* ssp. *rugosa*	Speckled alder	-	Dicotyledons	-
Betulaceae	*Alnus serrulata*	Common alder	-	Dicotyledons	-
Betulaceae	*Betula alleghaniensis*	Yellow birch	-	Dicotyledons	-
Betulaceae	*Betula pendula*	European weeping birch	*	Dicotyledons	-
Betulaceae	*Betula populifolia*	Gray birch	-	Dicotyledons	-
Betulaceae	*Carpinus caroliniana ssp. virginiana*	American hornbeam	-	Dicotyledons	-
Betulaceae	*Corylus americana*	American hazelnut	-	Dicotyledons	-
Betulaceae	*Ostrya virginiana*	Eastern hop-hornbeam	-	Dicotyledons	-
Bignoniaceae	*Campsis radicans*	Trumpet-vine	-	Dicotyledons	-
Bignoniaceae	*Catalpa bignonioides*	Southern catalpa	*	Dicotyledons	-
Bignoniaceae	*Catalpa speciosa*	Northern catalpa	*	Dicotyledons	-
Boraginaceae	*Echium vulgare*	Viper's bugloss	*	Dicotyledons	-
Boraginaceae	*Hackelia virginiana*	Stickseed	-	Dicotyledons	-
Boraginaceae	*Myosotis laxa*	Smaller forget-me-not	-	Dicotyledons	-
Boraginaceae	*Myosotis scorpioides*	True forget-me-not	*	Dicotyledons	-
Brassicaceae	*Alliaria petiolata*	Garlic mustard	*	Dicotyledons	-
Brassicaceae	*Barbarea vulgaris*	Yellow rocket	*	Dicotyledons	-
Brassicaceae	*Brassica nigra*	Black mustard	-	Dicotyledons	-
Brassicaceae	*Capsella bursa-pastoralis*	Sheperd's purse	*	Dicotyledons	-
Brassicaceae	*Cardamine concatenata*	Cut-leaved toothwort	-	Dicotyledons	-
Brassicaceae	*Cardamine diphylla*	Broad-leaved toothwort	-	Dicotyledons	-
Brassicaceae	*Cardamine douglasii*	Pink spring-cress	-	Dicotyledons	-
Brassicaceae	*Cardamine hirsuta*	Hoary bitter-cress	*	Dicotyledons	-
Brassicaceae	*Cardamine pensylvanica*	Pennsylvania bitter-cress	-	Dicotyledons	-
Brassicaceae	*Cardamine rhomboidea*	Bulbous bitter-cress	*	Dicotyledons	-
Brassicaceae	*Draba verna*	Whitlow-grass	*	Dicotyledons	-
Brassicaceae	*Lepidium campestre*	Field-cress	*	Dicotyledons	-
Brassicaceae	*Lepidium densiflorum*	Pepper-grass	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
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Brassicaceae	*Rorippa microphyllum*	Water-cress	*	Dicotyledons	-
Brassicaceae	*Rorippa palustris* var. *fernaldiana*	Common yellow-cress	-	Dicotyledons	-
Brassicaceae	*Sisymbrium officinale*	Hedge-mustard	*	Dicotyledons	-
Brassicaceae	*Thlaspi arvense*	Field penny-cress	*	Dicotyledons	-
Brassicaceae	*Turritis glabra*	Tower mustard	-	Dicotyledons	
Cabombaceae	*Brasenia schreberi*	watershield	-	Monocotyledons	-
Caesalpiniaceae	*Gleditsia triacanthos*	Honey-locust	-	Dicotyledons	-
Caesalpiniaceae	*Senna hebecarpa*	Northern wild senna	-	Dicotyledons	-
Campanulaceae	*Campanula americana*	Tall bellflower	-	Dicotyledons	-
Campanulaceae	*Campanula rapunculoides* var. *rapunculoides*	Creeping bellflower	*	Dicotyledons	-
Campanulaceae	*Lobelia cardinalis*	Cardinal-flower	-	Dicotyledons	-
Campanulaceae	*Lobelia inflata*	Indian tobacco	-	Dicotyledons	-
Campanulaceae	*Lobelia siphilitica*	Great blue lobelia	-	Dicotyledons	-
Campanulaceae	*Lobelia spicata var. spicata*	Spiked lobelia	-	Dicotyledons	-
Campanulaceae	*Triodanis perfoliata*	Venus' looking-glass	-	Dicotyledons	-
Cannabinaceae	*Humulus lupulus var. lupulus*	Hops	*	Dicotyledons	-
Caprifoliaceae	*Lonicera canadensis*	Canadian fly-honeysuckle	-	Dicotyledons	-
Caprifoliaceae	*Lonicera dioica var. dasygna*	Wild honeysuckle	-	Dicotyledons	-
Caprifoliaceae	*Lonicera japonica var. japonica*	Japanese honeysuckle	*	Dicotyledons	-
Caprifoliaceae	*Lonicera maackii*	Amur honeysuckle	*	Dicotyledons	-
Caprifoliaceae	*Lonicera morrowii*	Morrow's honeysuckle	*	Dicotyledons	-
Caprifoliaceae	*Lonicera tatarica*	Tartarian honeysuckle	*	Dicotyledons	-
Caprifoliaceae	*Lonicera x bella*	Showy pink honeysuckle	*	Dicotyledons	-
Caprifoliaceae	*Symphoricarpos orbiculatus*	Coralberry	-	Dicotyledons	-
Caryophyllaceae	*Arenaria serpyllifolia*	Thyme-leaf sandwort	*	Dicotyledons	-
Caryophyllaceae	*Cerastium vulgatum*	Common mouse-ear chickweed	*	Dicotyledons	-
Caryophyllaceae	*Dianthus armeria*	Deptford pink	*	Dicotyledons	-
Caryophyllaceae	*Saponaria officinalis*	Bouncing Bet	-	Dicotyledons	-
Caryophyllaceae	*Silene antirrhina*	Sleepy catchfly	-	Dicotyledons	-
Caryophyllaceae	*Silene noctiflora*	Sticky catchfly	*	Dicotyledons	-
Caryophyllaceae	*Stellaria graminea*	Common stichwort	-	Dicotyledons	-
Caryophyllaceae	*Stellaria longifolia*	Long-leaved stichwort	-	Dicotyledons	-
Caryophyllaceae	*Stellaria media*	Common chickweed	-	Dicotyledons	-
Celastraceae	*Celastrus orbiculatus*	Oriental bittersweet	*	Dicotyledons	-
Celastraceae	*Celastrus scandens*	American bittersweet	-	Dicotyledons	-
Celastraceae	*Euonymus alatus*	Winged burning-bush	*	Dicotyledons	-
Celastraceae	*Euonymus obovatus*	Running strawberry-bush	-	Dicotyledons	-
Ceratophyllaceae	*Ceratophyllum demersum*	Coontail	-	Dicotyledons	-
Chenopodiaceae	*Atriplex patula*	Spear saltbush	*	Dicotyledons	-
Chenopodiaceae	*Chenopodium album*	Lamb's quarters	*	Dicotyledons	-
Chenopodiaceae	*Chenopodium glaucum*	Oak-leaved goosefoot	*	Dicotyledons	-
Cleomaceae	*Polanisia dodecandra*	Clammy-weed	*	Dicotyledons	-
Cleomaceae	*Polanisia jamesii*	James' clammy-weed	*	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Clusiaceae	*Hypericum drummondii*	Nits-and-lice	-	Dicotyledons	-
Clusiaceae	*Hypericum gentianoides*	Orange-grass	-	Dicotyledons	-
Clusiaceae	*Hypericum majus*	Tall St. John's wort	-	Dicotyledons	-
Clusiaceae	*Hypericum mutilum*	Small-flowered St. John's wort	-	Dicotyledons	-
Clusiaceae	*Hypericum perforatum*	Common St. John's wort	-	Dicotyledons	-
Clusiaceae	*Hypericum prolificum*	Shrubby St. John's wort	-	Dicotyledons	-
Clusiaceae	*Hypericum punctatum*	Spotted St. John's wort	*	Dicotyledons	-
Clusiaceae	*Triadenum virginicum* var. *virginicum*	Marsh St. John's wort	-	Dicotyledons	-
Convallariaceae (Liliaceae)	*Convallaria majalis*	Lily-of-the-valley	*	Monocotyledons	-
Convallariaceae (Liliaceae)	*Maianthemum canadense* var. *canadense*	Canada mayflower	-	Monocotyledons	-
Convallariaceae (Liliaceae)	*Maianthemum racemosum*	False Solomon's-seal	-	Monocotyledons	-
Convallariaceae (Liliaceae)	*Maianthemum stellatum*	Starry false lily of the valley	-	Monocotyledons	-
Convallariaceae (Liliaceae)	*Medeola virginiana*	Indian cucumber-root	-	Monocotyledons	-
Convallariaceae (Liliaceae)	*Polygonatum biflorum*	Smooth Solomon's seal	-	Monocotyledons	-
Convallariaceae (Liliaceae)	*Polygonatum pubescens*	Hairy Solomon's seal	-	Monocotyledons	-
Convallariaceae (Liliaceae)	*Prosartes lanuginosa*	Yellow mandarin	-	Monocotyledons	-
Convallariaceae (Liliaceae)	*Uvularia sessilifolia*	Wild oats	-	Monocotyledons	-
Convolvulaceae	*Calystegia sepium*	Hedge-bindweed	-	Dicotyledons	-
Convolvulaceae	*Convolvulus arvensis*	Field-bindweed	*	Dicotyledons	-
Convolvulaceae	*Cuscuta gronovii*	Common dodder	-	Dicotyledons	-
Convolvulaceae	*Ipomea purpurea*	Common morning-glory	*	Dicotyledons	-
Cornaceae	*Cornus alternifolia*	Alternate-leaved dogwood	-	Dicotyledons	-
Cornaceae	*Cornus amomum* var. *schuezeana*	Silky dogwood	-	Dicotyledons	-
Cornaceae	*Cornus florida*	Flowering dogwood	-	Dicotyledons	-
Cornaceae	*Cornus racemosa*	Gray dogwood	-	Dicotyledons	-
Cornaceae	*Cornus stolonifera*	Red osier dogwood	-	Dicotyledons	-
Crassulaceae	*Hylotelephium telephium* var. *purpureum*	Live-forever	*	Dicotyledons	-
Crassulaceae	*Sedum ternatum*	Stonecrop	-	Dicotyledons	-
Cucurbitaceae	*Echinocystis lobata*	Wild cucumber	-	Dicotyledons	-
Cupressaceae	*Juniperus virginiana*	Eastern red cedar	-	Gymnosperms	-
Cupressaceae	*Thuja occidentalis*	Arbor vitae	-	Gymnosperms	P
Cyperaceae	*Carex albicans* var. *albicans*	Oak sedge	-	Monocotyledons	-
Cyperaceae	*Carex albicans* var. *emmonsii*	Emmon's sedge	-	Monocotyledons	-
Cyperaceae	*Carex albolutescens*	Greenwhite sedge	-	Monocotyledons	P
Cyperaceae	*Carex albursina*	White bear sedge	-	Monocotyledons	-
Cyperaceae	*Carex amphibola*	Eastern narrowleaf sedge	-	Monocotyledons	-
Cyperaceae	*Carex annectens* var. *annectens*	Yellow fox sedge	-	Monocotyledons	-
Cyperaceae	*Carex annectens* var. *xanthocarpa*	Yellow-fruited sedge	-	Monocotyledons	-
Cyperaceae	*Carex atlantica* var. *atlantica*	Prickly bog sedge	-	Monocotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Cyperaceae	*Carex blanda*	Common wood sedge	-	Monocotyledons	-
Cyperaceae	*Carex bromoides*	Brome-like sedge	-	Monocotyledons	-
Cyperaceae	*Carex buxbaumii*	Brown bog sedge	-	Monocotyledons	-
Cyperaceae	*Carex canescens* var. *disjuncta*	Silvery sedge	-	Monocotyledons	-
Cyperaceae	*Carex cephalophora*	Oval-headed sedge	-	Monocotyledons	-
Cyperaceae	*Carex communis*	Beech sedge	-	Monocotyledons	-
Cyperaceae	*Carex comosa*	Bearded sedge	-	Monocotyledons	-
Cyperaceae	*Carex crinita* var. *crinita*	Fringed sedge	-	Monocotyledons	-
Cyperaceae	*Carex cristatella*	Crested sedge	-	Monocotyledons	-
Cyperaceae	*Carex debilis* var. *debilis*	Weak sedge	-	Monocotyledons	-
Cyperaceae	*Carex debilis* var. *rugelii*	Rudge's sedge	-	Monocotyledons	-
Cyperaceae	*Carex digitalis* var. *digitalis*	Narrow-leaved sedge	-	Monocotyledons	-
Cyperaceae	*Carex emoryi*	Emory's sedge	-	Monocotyledons	-
Cyperaceae	*Carex festucacea*	Fescue sedge	-	Monocotyledons	-
Cyperaceae	*Carex flaccosperma*	Blue-green sedge	-	Monocotyledons	-
Cyperaceae	*Carex folliculata*	Northern long sedge	-	Monocotyledons	-
Cyperaceae	*Carex formosa*	Handsome sedge	-	Monocotyledons	E
Cyperaceae	*Carex frankii*	Frank's sedge	-	Monocotyledons	-
Cyperaceae	*Carex gracilescens*	Slender wood sedge	-	Monocotyledons	-
Cyperaceae	*Carex gracillima*	Graceful sedge	-	Monocotyledons	-
Cyperaceae	*Carex granularis* var. *granularis*	Meadow sedge	-	Monocotyledons	-
Cyperaceae	*Carex grayi*	Gray's sedge	-	Monocotyledons	-
Cyperaceae	*Carex grisea*	Gray wood sedge	-	Monocotyledons	-
Cyperaceae	*Carex hirsutella*	Hirsute sedge	-	Monocotyledons	-
Cyperaceae	*Carex hirtifolia*	Hairy wood sedge	-	Monocotyledons	-
Cyperaceae	*Carex hyalinolepis*	Sweet marsh sedge	-	Monocotyledons	-
Cyperaceae	*Carex hystericina*	Porcupine sedge	-	Monocotyledons	-
Cyperaceae	*Carex interior*	Inland sedge	-	Monocotyledons	-
Cyperaceae	*Carex itumescens*	Bladder sedge	-	Monocotyledons	-
Cyperaceae	*Carex lacustris*	Common lake sedge	-	Monocotyledons	-
Cyperaceae	*Carex laevivaginata*	Smooth-sheathed fox sedge	-	Monocotyledons	-
Cyperaceae	*Carex laxiculmis*	Weak-stemmed sedge	-	Monocotyledons	-
Cyperaceae	*Carex laxiflora* var. *laxiflora*	Two-edge sedge	-	Monocotyledons	-
Cyperaceae	*Carex leptalea*	Bristle-stalked sedge	-	Monocotyledons	-
Cyperaceae	*Carex leptonervia*	Nerveless woodland sedge	-	Monocotyledons	-
Cyperaceae	*Carex lupuliformis*	False hop sedge	-	Monocotyledons	P
Cyperaceae	*Carex lupulina*	Hop sedge	-	Monocotyledons	-
Cyperaceae	*Carex lurida*	Bottlebrush sedge	-	Monocotyledons	-
Cyperaceae	*Carex molesta*	Troublesome sedge	-	Monocotyledons	-
Cyperaceae	*Carex normalis*	Large straw sedge	-	Monocotyledons	-
Cyperaceae	*Carex pallescens*	Pale sedge	-	Monocotyledons	P
Cyperaceae	*Carex pedunculata*	Long-stalked sedge	-	Monocotyledons	-
Cyperaceae	*Carex pensylvanica*	Pennsylvania sedge	-	Monocotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Cyperaceae	*Carex plantaginea*	Plantain sedge	-	Monocotyledons	-
Cyperaceae	*Carex prasina*	Drooping sedge	-	Monocotyledons	-
Cyperaceae	*Carex radiata*	Radiate sedge	-	Monocotyledons	-
Cyperaceae	*Carex rosea*	Stellate sedge	-	Monocotyledons	-
Cyperaceae	*Carex scoparia*	Pointed broom sedge	-	Monocotyledons	-
Cyperaceae	*Carex seorsa*	Starry sedge	-	Monocotyledons	-
Cyperaceae	*Carex sparganioides*	Bur-reed sedge	-	Monocotyledons	-
Cyperaceae	*Carex squarrosa*	Squarrose sedge	-	Monocotyledons	-
Cyperaceae	*Carex stipata* var. *stipata*	Common fox sedge	-	Monocotyledons	-
Cyperaceae	*Carex straminea*	Straw sedge	-	Monocotyledons	P
Cyperaceae	*Carex stricta*	Tussock sedge	-	Monocotyledons	-
Cyperaceae	*Carex swanii*	Swan's sedge	-	Monocotyledons	-
Cyperaceae	*Carex tenera*	Bending sedge	-	Monocotyledons	-
Cyperaceae	*Carex torta*	Twisted sedge	-	Monocotyledons	-
Cyperaceae	*Carex tribuloides*	Blunt broom sedge	-	Monocotyledons	-
Cyperaceae	*Carex tuckermanii*	Tuckerman's sedge	-	Monocotyledons	-
Cyperaceae	*Carex umbellata*	Clustered sedge	-	Monocotyledons	-
Cyperaceae	*Carex utriculata*	Beaked sedge	-	Monocotyledons	-
Cyperaceae	*Carex vesicaria*	Blister sedge	-	Monocotyledons	-
Cyperaceae	*Carex vulpinoidea*	Foxtail sedge	-	Monocotyledons	-
Cyperaceae	*Carex willdenowii*	Willdenow's sedge	-	Monocotyledons	-
Cyperaceae	*Carex woodii*	Wood's sedge	-	Monocotyledons	-
Cyperaceae	*Cyperus bipartitus*	Shining umbrella-sedge	-	Monocotyledons	-
Cyperaceae	*Cyperus erythrorhizos*	Red-footed umbrella-sedge	-	Monocotyledons	-
Cyperaceae	*Cyperus esculentus*	Yellow nut-grass	-	Monocotyledons	-
Cyperaceae	*Cyperus flavescens*	Yellow flatsedge	-	Monocotyledons	-
Cyperaceae	*Cyperus squarrosus*	Bearded flatsedge	-	Monocotyledons	-
Cyperaceae	*Cyperus strigosus*	Galingale	-	Monocotyledons	-
Cyperaceae	*Dulichium arundinaceum*	Threeway sedge	-	Monocotyledons	-
Cyperaceae	*Eleocharis acicularis*	Needle spikerush	-	Monocotyledons	-
Cyperaceae	*Eleocharis erythropoda*	Red-footed spikerush	-	Monocotyledons	-
Cyperaceae	*Eleocharis obtusa*	Blunt spikerush	-	Monocotyledons	-
Cyperaceae	*Eleocharis palustris*	Small's spikerush	-	Monocotyledons	-
Cyperaceae	*Schoenoplectus tabernaemontani*	Soft-stem bulrush	-	Monocotyledons	-
Cyperaceae	*Scirpus atrovirens*	Dark green bulrush	-	Monocotyledons	-
Cyperaceae	*Scirpus cyperinus*	Wool-grass	-	Monocotyledons	-
Cyperaceae	*Scirpus georgianus*	Georgian dark green bulrush	-	Monocotyledons	-
Cyperaceae	*Scirpus hattorianus*	Smooth-leaved dark green bulrush	-	Monocotyledons	-
Cyperaceae	*Scirpus pedicillatus*	Pediceled wool-grass	-	Monocotyledons	-
Cyperaceae	*Scirpus pendulus*	Drooping bulrush	-	Monocotyledons	-
Cyperaceae	*Scirpus polyphyllus*	Leafy bulrush	-	Monocotyledons	-
Dennstaedtiaceae	*Dennstaedtia punctilobula*	Hay-scented fern	-	Pteridophytes	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Dennstaedtiaceae	*Pteridium aquilinum* var. *latiusculum*	Eastern bracken	-	Pteridophytes	-
Diervillaceae	*Diervilla lonicera*	Bush-honeysuckle	*	Dicotyledons	-
Dioscoreaceae	*Dioscorea villosa* var. *villosa*	Wild yam	-	Monocotyledons	-
Dipsacaceae	*Dipsacus fullonum*	Common teasel	*	Dicotyledons	-
Droseraceae	*Drosera rotundifolia*	Round-leaved sundew	-	Dicotyledons	-
Dryopteridaceae	*Athyrium filix-femina* var. *angustum*	Northern lady-fern	-	Pteridophytes	-
Dryopteridaceae	*Cystopteris protrusa*	Lowland brittle fern	-	Pteridophytes	-
Dryopteridaceae	*Cystopteris tenuis*	Mackay's brittle fern	-	Pteridophytes	-
Dryopteridaceae	*Deparia acrostichoides*	Silvery glade fern	-	Pteridophytes	-
Dryopteridaceae	*Dryopteris carthusiana*	Spinulose wood-fern	-	Pteridophytes	-
Dryopteridaceae	*Dryopteris cristata*	Crested wood-fern	-	Pteridophytes	-
Dryopteridaceae	*Dryopteris internnedia*	Fancy wood-fern	-	Pteridophytes	-
Dryopteridaceae	*Dryopteris marginalis*	Marginal wood-fern	-	Pteridophytes	-
Dryopteridaceae	*Onoclea sensibilis*	Sensitive fern	-	Pteridophytes	-
Dryopteridaceae	*Polystichum acrostichoides*	Christmas-fern	-	Pteridophytes	-
Elaeagnaceae	*Elaeagnus angustifolia*	Russian olive	*	Dicotyledons	-
Elaeagnaceae	*Elaeagnus umbellata*	Autumn olive	*	Dicotyledons	-
Equisetaceae	*Equisetum arvense*	Common horsetail	-	Pteridophytes	-
Equisetaceae	*Equisetum hyemale* var. *affine*	Common scouring-rush	-	Pteridophytes	-
Equisetaceae	*Equisetum sylvaticum*	Woodland-horsetail	-	Pteridophytes	P
Equisetaceae	*Equisetum variegatum*	Variegated horsetail	-	Pteridophytes	E
Equisetaceae	*Equisetum* x *mackaii*	Scouring-rush	-	Pteridophytes	-
Ericaceae	*Chimaphila maculata*	Spotted wintergreen	-	Dicotyledons	-
Ericaceae	*Gaultheria procumbens*	Wintergreen	-	Dicotyledons	-
Ericaceae	*Gaylussacia baccata*	Huckleberry	-	Dicotyledons	-
Ericaceae	*Vaccinium angustifolium*	Common lowbush-blueberry	-	Dicotyledons	-
Ericaceae	*Vaccinium corymbosum*	Highbush-blueberry	-	Dicotyledons	-
Ericaceae	*Vaccinium macrocarpon*	Large cranberry	-	Dicotyledons	-
Ericaceae	*Vaccinium pallidum*	Hillside blueberry	-	Dicotyledons	-
Ericaceae	*Vaccinium stamineum*	Deerberry	-	Dicotyledons	-
Euphorbiaceae	*Acalpha virginica* var. *rhomboidea*	Three-seeded mercury	-	Dicotyledons	-
Euphorbiaceae	*Acalypha virginica* var. *virginica*	Virginia threeseed mercury	-	Dicotyledons	-
Euphorbiaceae	*Chamaesyce vermiculata*	Wormseed sandmat	-	Dicotyledons	-
Euphorbiaceae	*Euphorbia cyparissias*	Cypress-spurge	*	Dicotyledons	-
Euphorbiaceae	*Euphorbia dentata*	Toothed spurge	*	Dicotyledons	-
Euphorbiaceae	*Euphorbia maculata*	Spotted spurge	-	Dicotyledons	-
Euphorbiaceae	*Euphorbia nutans*	Eyebane	-	Dicotyledons	-
Fabaceae	*Amphicarpaea bracteata*	Hog-peanut	-	Dicotyledons	-
Fabaceae	*Apios americana*	Common ground-nut	-	Dicotyledons	-
Fabaceae	*Cercis canadensis*	Eastern redbud	-	Dicotyledons	-
Fabaceae	*Coronilla varia*	Crown-vetch	*	Dicotyledons	-
Fabaceae	*Desmodium perplexum*	Stiff tick-trefoil	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
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Fabaceae	*Desomodium paniculatum*	Panicled tick-trefoil	-	Dicotyledons	-
Fabaceae	*Hesperis matronalis*	Dame's rocket	*	Dicotyledons	-
Fabaceae	*Lathyrus latifolius*	Everlasting pea	*	Dicotyledons	-
Fabaceae	*Lespedeza bicolor*	Shrub lespedeza	*	Dicotyledons	-
Fabaceae	*Lotus corniculatus*	Birdsfoot-trefoil	*	Dicotyledons	-
Fabaceae	*Lotus glaber*	Narrow-leaf bird's-foot trefoil	*	Dicotyledons	
Fabaceae	*Lotus purshianus* var. *purshianus*	Spanish clover	*	Dicotyledons	-
Fabaceae	*Medicago lupulina*	Black medick	*	Dicotyledons	-
Fabaceae	*Melilotus alba*	White sweet clover	*	Dicotyledons	-
Fabaceae	*Melilotus officinalis*	Yellow sweet clover	*	Dicotyledons	-
Fabaceae	*Robinia pseudoacacia*	Black locust	-	Dicotyledons	-
Fabaceae	*Trifolium aureum*	Palmate hop-clover	*	Dicotyledons	-
Fabaceae	*Trifolium campestre*	Pinnate hop-clover	*	Dicotyledons	-
Fabaceae	*Trifolium hybridum*	Alsike clover	*	Dicotyledons	-
Fabaceae	*Trifolium pratense*	Red clover	*	Dicotyledons	-
Fabaceae	*Trifolium repens*	White clover	*	Dicotyledons	-
Fabaceae	*Vicia angustifolia*	Narrow-leaved vetch	*	Dicotyledons	-
Fabaceae	*Vicia tetrasperma*	Four-seeded vetch	*	Dicotyledons	-
Fabaceae	*Vicia villosa*	Hairy vetch	*	Dicotyledons	-
Fabaceae	*Wisteria floribunda*	Japanese wisteria	-	Dicotyledons	-
Fagaceae	*Castanea dentata*	American chestnut	-	Dicotyledons	-
Fagaceae	*Fagus grandifolia*	American beech	-	Dicotyledons	-
Fagaceae	*Quercus alba*	White oak	-	Dicotyledons	-
Fagaceae	*Quercus bicolor*	Swamp white oak	-	Dicotyledons	-
Fagaceae	*Quercus imbricaria*	Shingle oak	-	Dicotyledons	-
Fagaceae	*Quercus macrocarpa*	Bur oak	-	Dicotyledons	-
Fagaceae	*Quercus montana*	Chestnut oak	*	Dicotyledons	-
Fagaceae	*Quercus palustris*	Pin oak	-	Dicotyledons	-
Fagaceae	*Quercus phellos*	Willow oak	*	Dicotyledons	-
Fagaceae	*Quercus rubra* var. *rubra*	Northern red oak	-	Dicotyledons	-
Fagaceae	*Quercus shumardii*	Shumard oak	-	Dicotyledons	-
Fagaceae	*Quercus velutina*	Black oak	-	Dicotyledons	-
Fagaceae	*Quercus x hawkinsiae*	Hawkin's hybrid oak	-	Dicotyledons	-
Fagaceae	*Quercus x jackiana*	Jack's oak	-	Dicotyledons	-
Fumeriaceae	*Dicentra canadensis*	Squirrel-corn	-	Dicotyledons	-
Gentianaceae	*Bartonia virginica*	Yellow screwstem	-	Dicotyledons	-
Gentianaceae	*Centaurium erythraea*	European century	*	Dicotyledons	-
Gentianaceae	*Centaurium pulchellum*	Branching centaury	*	Dicotyledons	-
Gentianaceae	*Gentiana clausa*	Closed gentian	-	Dicotyledons	-
Geraniaceae	*Geranium maculatum*	Wild geranium	-	Dicotyledons	-
Grossulariaceae	*Ribes americanum*	Eastern black currant	-	Dicotyledons	-
Grossulariaceae	*Ribus aureum* var. *villosum*	Golden currant	*	Dicotyledons	-
Grossulariaceae	*Ribes cynosbati*	Dogberry	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Haloragaceae	*Myriophyllum spicatum*	Eurasian water-milfoil	*	Dicotyledons	-
Hamamelidaceae	*Hamamelis virginiana*	Witch-hazel	-	Dicotyledons	-
Hamamelidaceae	*Liquidambar styraciflua*	Sweetgum	*	Dicotyledons	-
Hemerocallidaceae (Liliaceae)	*Hemerocallis fulva* var. *fulva*	Day-lily	*	Monocotyledons	-
Hemerocallidaceae (Liliaceae)	*Hemerocallis fulva* var. *kwanso*	Day-lily	*	Monocotyledons	-
Hippocastanaceae	*Aesculus hippocastanum*	Horse-chestnut	*	Dicotyledons	-
Hyacinthaceae (Liliaceae)	*Muscari botryoides*	Grape-hyacinth	*	Monocotyledons	
Hyacinthaceae (Liliaceae)	*Ornithogalum umbellatum*	Star of Bethlehem	*	Monocyledons	-
Hydrangeaceae	*Philadelphus coronarius*	European mock-orange	*	Dicotyledons	-
Hydrocharitaceae	*Elodea canadensis*	Common water-weed	-	Monocotyledons	-
Hydrocharitaceae	*Vallisineria americana* var. *americana*	Eel-grass	-	Monocotyledons	-
Hydrophyllaceae	*Hydrophyllum virginianum*	Virginia waterleaf	-	Dicotyledons	-
Iridaceae	*Iris germanica*	Garden Iris	*	Monocotyledons	-
Iridaceae	*Iris pseudoacorus*	Yellow water flag	*	Monocotyledons	-
Iridaceae	*Iris versicolor*	Northern blue flag	-	Monocotyledons	-
Iridaceae	*Sisyrinchium albidum*	Prairie blue-eyed grass	-	Monocotyledons	-
Iridaceae	*Sisyrinchium angustifolium*	Blue-eyed grass	-	Monocotyledons	-
Iridaceae	*Sisyrinchium montanum*	Strict blue-eyed grass	-	Monocotyledons	T
Isoetaceae	*Isoetes engelmannnii*	Appalachian quillwort	-	Monocotyledons	E
Juglandaceae	*Juglans cinerea*	Butternut	-	Dicotyledons	-
Juglandaceae	*Juglans nigra*	Black walnut	-	Dicotyledons	-
Juglandaceae	*Carya cordiformis*	Bitternut hickory	-	Dicotyledons	-
Juglandaceae	*Carya glabra*	Pignut hickory	-	Dicotyledons	-
Juglandaceae	*Carya laciniosa*	Shellbark hickory	-	Dicotyledons	-
Juglandaceae	*Carya ovata* var. *ovata*	Shagbark hickory	-	Dicotyledons	-
Juncaceae	*Juncus acuminatus*	Sharp-fruited rush	-	Monocotyledons	-
Juncaceae	*Juncus anthelatus*	Branched rush	-	Monocotyledons	-
Juncaceae	*Juncus articulatus*	Jointed rush	-	Monocotyledons	-
Juncaceae	*Juncus biflorus*	Two-flowered rush	-	Monocotyledons	-
Juncaceae	*Juncus brachycarpus*	Short-fruited rush	-	Monocotyledons	-
Juncaceae	*Juncus bufonius*	Toad rush	-	Monocotyledons	-
Juncaceae	*Juncus canadensis*	Canada rush	-	Monocotyledons	-
Juncaceae	*Juncus dudleyi*	Dudley's rush	-	Monocotyledons	-
Juncaceae	*Juncus effusus*	Common rush	-	Monocotyledons	-
Juncaceae	*Juncus marginatus*	Grass-leaved rush	-	Monocotyledons	-
Juncaceae	*Juncus nodosus*	Knotted rush	-	Monocotyledons	-
Juncaceae	*Juncus tenuis*	Path rush	-	Monocotyledons	-
Juncaceae	*Juncus torreyi*	Torrey's rush	-	Monocotyledons	-
Juncaceae	*Luzula acuminata* var. *acuminata*	Evergreen wood-rush	-	Monocotyledons	-
Juncaceae	*Luzula multiflora*	Common wood-rush	-	Monocotyledons	-
Lamiaceae	*Ajuga reptans*	Carpet-bugle	*	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Lamiaceae	*Blephilia ciliata*	Downy woodmint	-	Dicotyledons	-
Lamiaceae	*Blephilia hirsuta*	Hairy woodmint	-	Dicotyledons	-
Lamiaceae	*Clinopodium vulgare*	Wild basil	-	Dicotyledons	-
Lamiaceae	*Collinsonia canadensis*	Northern horse-balm	-	Dicotyledons	-
Lamiaceae	*Glechoma hederacea*	Gill-over-the-ground	*	Dicotyledons	-
Lamiaceae	*Hedeoma polygeodes*	American pennyroyal	-	Dicotyledons	-
Lamiaceae	*Lamium purpureum*	Red dead-nettle	*	Dicotyledons	-
Lamiaceae	*Leonurus cardiaca*	Motherwort	*	Dicotyledons	-
Lamiaceae	*Lycopus americanus*	American water-horehound	-	Dicotyledons	-
Lamiaceae	*Lycopus virginicus* var. *pauciflorus*	Virginia water-horehound	-	Dicotyledons	-
Lamiaceae	*Mentha arvensis*	Field-mint	-	Dicotyledons	-
Lamiaceae	*Mentha spicata*	Spearmint	*	Dicotyledons	-
Lamiaceae	*Mentha* x *piperata* var. *piperata*	Peppermint	*	Dicotyledons	-
Lamiaceae	*Monarda fistulosa* var. *fistulosa*	Wild bergamot	-	Dicotyledons	-
Lamiaceae	*Nepeta cataria*	Cat-nip	*	Dicotyledons	-
Lamiaceae	*Physostegia virginiana*	Obedient plant	-	Dicotyledons	-
Lamiaceae	*Pycnanthemum muticum*	Blunt mountain-mint	-	Dicotyledons	-
Lamiaceae	*Pycnanthemum tenuifolium*	Narrow-leaved mountain-mint	-	Dicotyledons	-
Lamiaceae	*Pycnanthemum verticillatum* var. *verticillatum*	Verticillate mountain-mint	-	Dicotyledons	-
Lamiaceae	*Pycnanthemum virginianum*	Virginia mountain-mint	-	Dicotyledons	-
Lamiaceae	*Scutellaria epilobiifolia*	Marsh skullcap	-	Dicotyledons	-
Lamiaceae	*Scutellaria lateriflora*	Mad-dog skullcap	-	Dicotyledons	-
Lamiaceae	*Teucrium canadense* var. *canadense*	American germander	-	Dicotyledons	-
Lamiaceae	*Prunella vulgaris* var. *lanceolata*	Self-heal	-	Dicotyledons	-
Lardizabalaceae	*Akebia quinata*	Chocolate-vine	*	Dicotyledons	-
Lauraceae	*Lindera benzoin* var. *benzoin*	Spicebush	-	Dicotyledons	-
Lauraceae	*Sassafras albidum*	Sassafras	-	Dicotyledons	-
Lentibulariaceae	*Utricularia gibba*	Humped bladderwort	-	Dicotyledons	-
Lentibulariaceae	*Utricularia vulgaris*	Greater bladderwort	-	Dicotyledons	-
Liliaceae	*Erythronium americanum*	Yellow trout-lily	-	Monocotyledons	-
Liliaceae	*Lillium canadense* var. *canadense*	Canada lily	-	Monocotyledons	-
Limnanthaceae	*Floerkea proserpinacoides*	False mermaid	-	Dicotyledons	-
Linaceae	*Linum medium* var. *texanum*	Stiff yellow flax	-	Dicotyledons	-
Linaceae	*Linum striatum*	Ridged yellow flax	-	Dicotyledons	-
Linaceae	*Linum virginianum*	Slender yellow flax	-	Dicotyledons	-
Linderniaceae	*Lindernia dubia* var. *dubia*	False pimpernel	-	Dicotyledons	-
Lycopodiaceae	*Diphasiastrum digitatum*	Southern ground-cedar	-	Pteridophytes	-
Lycopodiaceae	*Diphasiastrum tristachyum*	Blue ground-cedar	-	Pteridophytes	-
Lycopodiaceae	*Diphasiastrum* x *harberii*	Club moss	-	Pteridophytes	-
Lycopodiaceae	*Huperzia lucidula*	Shining clubmoss	-	Pteridophytes	-
Lycopodiaceae	*Huperzia* x *bartleyi*	Bartley's clubmoss	-	Pteridophytes	-
Lycopodiaceae	*Lycopodiella inundata*	Bog clubmoss	-	Pteridophytes	-

CAMP RAVENNA – VASCULAR PLANTS					
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Lycopodiaceae	*Lycopodium clavatum* var. *clavatum*	Running clubmoss	-	Pteridophytes	-
Lycopodiaceae	*Lycopodium hickeyi*	Hickey's tree clubmoss	-	Pteridophytes	-
Lycopodiaceae	*Lycopodium obscurum*	Ground pine	-	Pteridophytes	-
Lythraceae	*Decodon verticillata*	Swamp loosestrife	-	Dicotyledons	-
Lythraceae	*Lythrum alatum*	Wing-angled loosestrife	-	Dicotyledons	-
Lythraceae	*Lythrum salicaria*	Purple loosestrife	*	Dicotyledons	-
Magnoliaceae	*Liriodendron tulipifera*	Tulip-tree	-	Dicotyledons	-
Magnoliaceae	*Magnolia acuminata*	Cucumber magnolia	-	Dicotyledons	-
Magnoliaceae	*Rhododendron nudiflorum* var. *roseum*	Northern rose azalea	-	Dicotyledons	-
Malvaceae	*Abutilon theophrasti*	Velvet-leaf	*	Dicotyledons	-
Malvaceae	*Hibiscus moscheutos*	Rose mallow	-	Dicotyledons	-
Malvaceae	*Hibiscus trionum*	Flower of an hour	*	Dicotyledons	-
Malvaceae	*Malva neglecta*	Cheeses	*	Dicotyledons	-
Menispermaceae	*Menispermum canadense*	Moonseed	-	Dicotyledons	-
Molluginaceae	*Mollugo verticillata*	Carpet-weed	*	Dicotyledons	-
Monotropaceae	*Monotropa hypopithys*	Pinesap	-	Dicotyledons	-
Monotropaceae	*Monotropa uniflora*	Indian pipe	-	Dicotyledons	-
Moraceae	*Maclura promifera*	Osage-orange	*	Dicotyledons	-
Moraceae	*Morus alba*	White mulberry	*	Dicotyledons	-
Moraceae	*Morus rubra*	Red mulberry	-	Dicotyledons	-
Myricaceae	*Myrica heterophylla*	Evergreen bayberry	*	Dicotyledons	-
Najadaceae	*Najas flexilis*	Northern water-nymph	-	Monocotyledons	-
Najadaceae	*Najas minor*	Eurasian naiad	*	Monocotyledons	-
Nymphaeaceae	*Nuphar advena*	Spatterdock	-	Dicotyledons	-
Nymphaeaceae	*Nymphea odorata* ssp. *tuberosa*	Water-lily	-	Dicotyledons	-
Nyssaceae	*Nyssa sylvatica*	Black-gum	-	Dicotyledons	-
Oleaceae	*Forsythia suspensa*	Forsythia	*	Dicotyledons	-
Oleaceae	*Fraxinus americana* var. *americana*	White ash	-	Dicotyledons	-
Oleaceae	*Fraxinus nigra*	Black ash	-	Dicotyledons	-
Oleaceae	*Fraxinus pensylvanica* var. *pensylvanica*	Red ash	-	Dicotyledons	-
Oleaceae	*Fraxinus pensylvanica* var. *subintegerrima*	Green ash	-	Dicotyledons	-
Oleaceae	*Fraxinus profunda*	Pumpkin ash	-	Dicotyledons	
Oleaceae	*Ligustrum obtusifolium*	Privet	*	Dicotyledons	-
Oleaceae	*Syringa vulgaris*	Lilac	*	Dicotyledons	-
Onagraceae	*Circaea alpina*	Alpine echanter's nightshade	-	Dicotyledons	-
Onagraceae	*Circaea lutetiana*	Common echanter's nightshade	-	Dicotyledons	-
Onagraceae	*Epilobium ciliatum*	American willow-herb	-	Dicotyledons	-
Onagraceae	*Epilobium coloratum*	Eastern willow-herb	-	Dicotyledons	-
Onagraceae	*Epilobium lepthophyllum*	Linear-leaved willow-herb	-	Dicotyledons	-
Onagraceae	*Epilobium parviflorum*	Small flowered hairy willow-herb	*	Dicotyledons	-
Onagraceae	*Epilobium strictum*	Simple willow-herb	-	Dicotyledons	T

CAMP RAVENNA – VASCULAR PLANTS					
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Onagraceae	*Ludwigia alternifolia*	Square-pod water-willow	-	Dicotyledons	-
Onagraceae	*Ludwigia palustris*	Common water-purslane	-	Dicotyledons	-
Onagraceae	*Oenothera biennis* var. *biennis*	Common evening-primrose	-	Dicotyledons	-
Onagraceae	*Oenothera fruticosa* var. *ambigua*	Southern sundrops	-	Dicotyledons	-
Onagraceae	*Oenothera perennis*	Little sundrops	-	Dicotyledons	-
Onagraceae	*Oenothera pilosella*	Meadow sundrops	-	Dicotyledons	-
Onagraceae	*Oenothera villosa*	Hairy evening primrose	-	Dicotyledons	-
Ophioglossaceae	*Botrychium dissectum*	Common grape fern	-	Pteridophytes	-
Ophioglossaceae	*Botrychium matricariifolium*	Daisy-leaved grape fern	-	Pteridophytes	-
Ophioglossaceae	*Botrychium oneidense*	Blunt-lobed grape fern	-	Pteridophytes	-
Orchidaceae	*Epipactus helleborine*	Helleborine	*	Monocotyledons	-
Orchidaceae	*Liparis loesellii*	Loesel's twayblade	-	Monocotyledons	-
Orchidaceae	*Platanthera lacera*	Ragged fringed orchid	-	Monocotyledons	-
Orchidaceae	*Spiranthes cernua* var. *cernua*	Nodding ladies'-tresses	-	Monocotyledons	-
Orchidaceae	*Spiranthes lacera* var. *gracilis*	Slender ladies'-tresses	-	Monocotyledons	-
Orchidaceae	*Spiranthes lucida*	Shining ladies'-tresses	-	Monocotyledons	P
Orchidaceae	*Spiranthes tuberosa*	Little ladies'-tresses	-	Monocotyledons	-
Orobanchaceae	*Agalinis tenuifolia*	Common false-foxglove	-	Dicotyledons	-
Orobanchaceae	*Conopholis americana*	Squaw-root	-	Dicotyledons	-
Orobanchaceae	*Epifagus virginiana*	Beech-drops	-	Dicotyledons	-
Orobanchaceae	*Pedicularis canadensis*	Common lousewort	-	Dicotyledons	-
Osmundaceae	*Osmunda cinnamomea*	Cinnamon-fern	-	Pteridophytes	-
Osmundaceae	*Osmunda claytoniana*	Interrupted fern	-	Pteridophytes	-
Osmundaceae	*Osmunda regalis* var. *spectabilis*	Royal fern	-	Pteridophytes	-
Oxalidaceae	*Oxalis corniculata*	Creeping yellow wood-sorrel	*	Dicotyledons	-
Oxalidaceae	*Oxalis dillenii*	Southern yellow wood-sorrel	-	Dicotyledons	-
Oxalidaceae	*Oxalis stricta*	Common yellow wood-sorrel	*	Dicotyledons	-
Paeonaceae	*Paeonia lactiflora*	Peony	*	Dicotyledons	-
Papaveraceae	*Chelidonium majus*	Celandine	*	Dicotyledons	-
Papaveraceae	*Sanguinaria canadensis*	Bloodroot	-	Dicotyledons	-
Phrymaceae	*Mimulus alatus*	Sharp-winged monkey-flower	-	Dicotyledons	-
Phrymaceae	*Mimulus ringens* var. *ringens*	Common monkey-flower	-	Dicotyledons	-
Phytoloccaceae	*Phytolacca americana*	Pokeweed	-	Dicotyledons	-
Pinaceae	*Larix decidua*	European larch	*	Gymnosperms	-
Pinaceae	*Picea abies*	Norway spruce	*	Gymnosperms	-
Pinaceae	*Picea glauca*	White spruce	*	Gymnosperms	-
Pinaceae	*Picea pungens*	Colorado blue spruce	*	Gymnosperms	-
Pinaceae	*Picea rubens*	Red spruce	*	Gymnosperms	-
Pinaceae	*Pinus banksiana*	Jack-pine	*	Gymnosperms	-
Pinaceae	*Pinus nigra*	Austrian pine	*	Gymnosperms	-
Pinaceae	*Pinus resinosa*	Red pine	*	Gymnosperms	-
Pinaceae	*Pinus strobus*	White pine	-	Gymnosperms	-
Pinaceae	*Pinus sylvestris*	Scots pine	*	Gymnosperms	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Pinaceae	*Tsuga canadensis*	Eastern hemlock	-	Gymnosperms	-
Plantaginaceae	*Callitriche heterophylla*	Larger water-starwort	-	Dicotyledons	-
Plantaginaceae	*Chaenorhinum minus*	Dwarf snapdragon	*	Dicotyledons	-
Plantaginaceae	*Chelone glabra* var. *glabra*	White turtlehead	-	Dicotyledons	-
Plantaginaceae	*Gratiola neglecta*	Common hedge-hyssop	-	Dicotyledons	-
Plantaginaceae	*Leucospora multifida*	Narrowleaf paleseed	-	Dicotyledons	-
Plantaginaceae	*Linaria vulgaris*	Butter-and-eggs	-	Dicotyledons	-
Plantaginaceae	*Penstemon digitalis*	Tall white beard-tongue	-	Dicotyledons	-
Plantaginaceae	*Plantago lanceolata*	English plantain	*	Dicotyledons	-
Plantaginaceae	*Plantago major*	Common plantain	*	Dicotyledons	-
Plantaginaceae	*Plantago rugelii*	Rugel's plantain	-	Dicotyledons	-
Plantaginaceae	*Veronica arvensis*	Corn speedwell	*	Dicotyledons	-
Plantaginaceae	*Veronica officinalis*	Common speedwell	*	Dicotyledons	-
Plantaginaceae	*Veronica peregrina*	Purslane speedwell	-	Dicotyledons	-
Plantaginaceae	*Veronica serpyllifolia*	Thyme-leaved speedwell	*	Dicotyledons	-
Platanaceae	*Platanus occidentalis*	Sycamore	-	Dicotyledons	-
Poaceae	*Agrostis capillaris*	Rhode Island bent grass	*	Monocotyledons	-
Poaceae	*Agrostis gigantea*	Redtop	*	Monocotyledons	-
Poaceae	*Agrostis hyemalis* var. *scabra*	Fly-away grass	-	Monocotyledons	-
Poaceae	*Agrostis perennans* var. *perennans*	Autumn bent grass	-	Monocotyledons	-
Poaceae	*Alopecurus carolinianus*	Carolina foxtail	-	Monocotyledons	-
Poaceae	*Alopecurus pratensis*	Meadow foxtail	*	Monocotyledons	-
Poaceae	*Andropogon gerardii*	Big bluestem	-	Monocotyledons	-
Poaceae	*Andropogon virginicus* var. *virginicus*	Broom-sedge	-	Monocotyledons	-
Poaceae	*Anthoxanthum odoratum*	Sweet vernal grass	*	Monocotyledons	-
Poaceae	*Aristida dichotoma*	Churchmouse three-awn grass	-	Monocotyledons	-
Poaceae	*Aristida oligantha*	Prairie three-awned grass	-	Monocotyledons	-
Poaceae	*Arrhenatherum elatius*	Tall oatgrass	*	Monocotyledons	-
Poaceae	*Arthraxon hispidus*	Small carpgrass	*	Monocotyledons	-
Poaceae	*Brachyelytrum erectum* var. *sepentrionale*	Long-awned wood grass	-	Monocotyledons	-
Poaceae	*Bromus ciliatus*	Fringed brome	-	Monocotyledons	-
Poaceae	*Bromus commutatus*	Hairy chess	*	Monocotyledons	-
Poaceae	*Bromus inermis*	Smooth brome	*	Monocotyledons	-
Poaceae	*Bromus japonicus*	Japanese brome	*	Monocotyledons	-
Poaceae	*Bromus tectorum*	Downy chess	*	Monocotyledons	-
Poaceae	*Cinna arundinacea*	Common wood-reed	-	Monocotyledons	-
Poaceae	*Dactylis glomerata*	Orchard grass	*	Monocotyledons	-
Poaceae	*Danthonia compressa*	Flattened wild-oat grass	-	Monocotyledons	-
Poaceae	*Danthonia spicata* var. *spicata*	Poverty oat grass	-	Monocotyledons	-
Poaceae	*Digitaria ischaemeum*	Smooth crab-grass	*	Monocotyledons	-
Poaceae	*Dichanthelium clandestinum*	Deertongue grass	-	Monocotyledons	-
Poaceae	*Dichanthelium commutatum*	Variable panic grass	-	Monocotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Poaceae	*Dichanthelium dichotomum*	Forked panic grass	-	Monocotyledons	-
Poaceae	*Dichanthelium lanuginosum* var. *fasciculatum*	Old-field panic grass	-	Monocotyledons	-
Poaceae	*Dichanthelium lanuginosum* var. *implicatum*	Hairy panic grass	-	Monocotyledons	-
Poaceae	*Dichanthelium latifolium*	Broad-leaved panic grass	-	Monocotyledons	-
Poaceae	*Dichanthelium microcarpon*	Small fruited panic grass	-	Monocotyledons	-
Poaceae	*Echinochloa crusgalli* var. *crusgalli*	Barnyard grass	-	Monocotyledons	-
Poaceae	*Echinochlora muricata* var. *muricata*	Southern barnyard grass	-	Monocotyledons	-
Poaceae	*Elusine indica*	Indian goosegrass	*	Monocotyledons	-
Poaceae	*Elymus canadensis*	Canada wild-rye	-	Monocotyledons	-
Poaceae	*Elymus hystrix*	Bottle-brush grass	-	Monocotyledons	-
Poaceae	*Elymus riparius*	Streambank wild rye	-	Monocotyledons	-
Poaceae	*Elymus villosa*	Downy wild rye	-	Monocotyledons	-
Poaceae	*Elymus virginicus* var. *virginicus*	Virginia wild rye	-	Monocotyledons	-
Poaceae	*Elytrigia repens*	Quack-grass	*	Monocotyledons	-
Poaceae	*Eragrostis frankii*	Sandbar love grass	-	Monocotyledons	-
Poaceae	*Eragrostis minor*	Low love grass	*	Monocotyledons	-
Poaceae	*Eragrostis pectinacea*	Carolina love grass	*	Monocotyledons	-
Poaceae	*Eragrostis pilosa*	Indian lovegrass	*	Monocotyledons	-
Poaceae	*Eragrostis spectabilis*	Purple lovegrass	-	Monocotyledons	-
Poaceae	*Festuca arundinacea*	Tall fescue	*	Monocotyledons	-
Poaceae	*Festuca pratensis*	Meadow-fescue	*	Monocotyledons	-
Poaceae	*Festuca rubra var. rubra*	Red fescue	*	Monocotyledons	-
Poaceae	*Festuca subverticillata*	Nodding fescue	-	Monocotyledons	-
Poaceae	*Glyceria acutiflora*	Sharp-glumed manna grass	-	Monocotyledons	P
Poaceae	*Glyceria canadensis*	Rattlesnake grass	-	Monocotyledons	-
Poaceae	*Glyceria melicaria*	Melic mannagrass	-	Monocotyledons	-
Poaceae	*Glyceria sepentrionalis*	Eastern manna grass	-	Monocotyledons	-
Poaceae	*Glyceria striata*	Fowl manna grass	-	Monocotyledons	-
Poaceae	*Holcus lanatus*	Velvet grass	*	Monocotyledons	-
Poaceae	*Hordeum jubatum*	Squirreltail grass	*	Monocotyledons	-
Poaceae	*Leersia oryzoides*	Rice cutgrass	-	Monocotyledons	-
Poaceae	*Leersia virginica*	Woodland cut grass	-	Monocotyledons	-
Poaceae	*Lolium perenne var. perenne*	Perennial rye-grass	*	Monocotyledons	-
Poaceae	*Microstegium vimineum*	Japanese stilt grass	*	Monocotyledons	-
Poaceae	*Millium effusum*	Wood-millet	-	Monocotyledons	-
Poaceae	*Miscanthus sinensis*	Eulalia	*	Monocotyledons	-
Poaceae	*Muhlenbergia asperifolia*	Scratch grass	*	Monocotyledons	-
Poaceae	*Muhlenbergia mexicana*	Leafy satin grass	-	Monocotyledons	-
Poaceae	*Muhlenbergia schreberi*	Nimblewill	-	Monocotyledons	-
Poaceae	*Muhlenbergia sylvatica*	Forest satin grass	-	Monocotyledons	-
Poaceae	*Panicum anceps*	Beaked panicgrass	-	Monocotyledons	-
Poaceae	*Panicum capillare*	Witch-grass	-	Monocotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
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Poaceae	*Panicum dichotomiflorum*	Fall panic grass	-	Monocotyledons	-
Poaceae	*Panicum gatteringii*	Gattinger's panic grass	-	Monocotyledons	-
Poaceae	*Panicum linearifolium var. linearifolium*	Slender-leaved panic grass	-	Monocotyledons	-
Poaceae	*Panicum milaceum*	Proso millet	*	Monocotyledons	-
Poaceae	*Panicum philadelphicum*	Philadelphia panicgrass	-	Monocotyledons	E
Poaceae	*Panicum rigidulum*	Redtop panicgrass	-	Monocotyledons	-
Poaceae	*Panicum virgatum*	Switchgrass	-	Monocotyledons	-
Poaceae	*Paspalum ciliatifolium*	Thin paspalum	-	Monocotyledons	-
Poaceae	*Phalaris arundinacea* var. *arundinacea*	Reed canary grass	-	Monocotyledons	-
Poaceae	*Phalaris arundinacea* var. *picta*	Ribbon grass	*	Monocotyledons	-
Poaceae	*Phleum pratense*	Timothy	*	Monocotyledons	-
Poaceae	*Phragmites australis*	Common reed	*	Monocotyledons	-
Poaceae	*Poa alsodes*	Wood spear grass	-	Monocotyledons	-
Poaceae	*Poa annua*	Annual blue grass	*	Monocotyledons	-
Poaceae	*Poa compressa*	Canada blue grass	*	Monocotyledons	-
Poaceae	*Poa cuspidata*	Cuspidate spear grass	-	Monocotyledons	-
Poaceae	*Poa paludigena*	Bog bluegrass	-	Monocotyledons	-
Poaceae	*Poa palustris*	Fowl meadow grass	-	Monocotyledons	-
Poaceae	*Poa pratensis*	Kentucky blue grass	*	Monocotyledons	-
Poaceae	*Poa sylvestris*	Forest blue grass	-	Monocotyledons	-
Poaceae	*Poa trivialis*	Rough blue grass	*	Monocotyledons	-
Poaceae	*Puccinelli a pallida*	Pale manna grass	-	Monocotyledons	-
Poaceae	*Puccinellia distans*	European alkali grass	*	Monocotyledons	-
Poaceae	*Schizachyrium scoparium*	Little bluestem	-	Monocotyledons	-
Poaceae	*Setaria faberi*	Nodding foxtail-grass	*	Monocotyledons	-
Poaceae	*Setaria glauca*	Yellow foxtail-grass	*	Monocotyledons	-
Poaceae	*Setaria viridis*	Green foxtail-grass	*	Monocotyledons	-
Poaceae	*Sorghastrum nutans*	Indian grass	-	Monocotyledons	-
Poaceae	*Sorghum halepense*	Johnson-grass	*	Monocotyledons	-
Poaceae	*Spenopholis obtusata* var. *major*	Wedge-grass	-	Monocotyledons	-
Poaceae	*Sphenopholis pensylvanica*	Swamp oats	-	Monocotyledons	-
Poaceae	*Sporobolis asper* var. *asper*	Tall dropseed	-	Monocotyledons	-
Poaceae	*Sporobolis vaginiflorus*	Poverty-grass	-	Monocotyledons	-
Poaceae	*Sporobolus neglectus*	Puffsheath dropseed	-	Monocotyledons	-
Poaceae	*Tridens flavus* var. *flavus*	Grease-grass	-	Monocotyledons	-
Poaceae	*Tripsacum dactyloides*	Eastern gamagrass	-	Monocotyledons	-
Poaceae	*Triticum aestivum L.*	Wheat	*	Monocotyledons	-
Poaceae	*Digitaria sanguinalis*	Northern crab-grass	*	Monocotyledons	-
Polemoniaceae	*Phlox divaricata*	Blue phlox	-	Dicotyledons	-
Polemoniaceae	*Phlox paniculata*	Garden phlox	-	Dicotyledons	-
Polemoniaceae	*Polemonium reptans* var. *reptans*	Jacob's ladder	-	Dicotyledons	-
Polygalaceae	*Polygala sanguinea*	Blood-milkwort	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
Family	*Scientific Name*	Common Name	* = Not native	Group	State Status
Polygalaceae	*Polygala verticillata* var. *verticillata*	Whorled milkwort	-	Dicotyledons	-
Polygonaceae	*Polygonum amphibium* var. *emersum*	Water smartweed	-	Dicotyledons	-
Polygonaceae	*Polygonum amphibium* var. *stipulaceum*	Water smartweed	-	Dicotyledons	-
Polygonaceae	*Polygonum arifolium*	Halberd-leaved tearthumb	-	Dicotyledons	-
Polygonaceae	*Polygonum aviculare*	Common knotweed	*	Dicotyledons	-
Polygonaceae	*Polygonum caespitosum* var. *longisetum*	Bristly lady's-thumb	*	Dicotyledons	-
Polygonaceae	*Polygonum cuspidatum*	Japanese knotweed	*	Dicotyledons	-
Polygonaceae	*Polygonum hydropiper*	Water-pepper	*	Dicotyledons	-
Polygonaceae	*Polygonum hydropiperoides* var. *hydropiperoides*	False water-pepper	-	Dicotyledons	-
Polygonaceae	*Polygonum lapathifolium*	Nodding smartweed	-	Dicotyledons	-
Polygonaceae	*Polygonum pensylvanicum*	Pennsylvania smartweed	-	Dicotyledons	-
Polygonaceae	*Polygonum persicaria*	Lady's thumb	*	Dicotyledons	-
Polygonaceae	*Polygonum punctatum* var. *punctatum*	Dotted smartweed	-	Dicotyledons	-
Polygonaceae	*Polygonum sagittatum*	Arrow-leaved tear-thumb	-	Dicotyledons	-
Polygonaceae	*Polygonum scandens* var. *scandens*	Climbing false-buckwheat	-	Dicotyledons	-
Polygonaceae	*Polygonum virginianum*	Jumpseed	-	Dicotyledons	-
Polygonaceae	*Rumex acetosella*	Sheep sorrel	*	Dicotyledons	-
Polygonaceae	*Rumex crispus*	Curly dock	*	Dicotyledons	-
Polygonaceae	*Rumex obtusifolius*	Bitter dock	-	Dicotyledons	-
Polygonaceae	*Rumex orbiculatus*	Swamp dock	-	Dicotyledons	-
Polypodiaceae	*Polypodium appalachianum* x *Polypodium virginianum*	Polypody	-	Pteridophytes	-
Polypodiaceae	*Polypodium virginianum*	Common polypody	-	Pteridophytes	-
Pontederiaceae	*Pontederia cordata*	Pickerelweed	-	Monocotyledons	-
Portulacaceae	*Claytonia virginica*	Spring beauty	-	Dicotyledons	-
Portulacaceae	*Portuluca oleracea*	Common purslane	*	Dicotyledons	-
Potamogetaceae	*Potamogeton crispus*	Curly pondweed	*	Monocotyledons	-
Potamogetaceae	*Potamogeton diversifolius*	Common snailseed-pondweed	-	Monocotyledons	-
Potamogetaceae	*Potamogeton epihydrus*	Ribbon-leaved pondweed	-	Monocotyledons	-
Potamogetaceae	*Potamogeton foliosus*	Leafy pondweed	-	Monocotyledons	-
Potamogetaceae	*Potamogeton nodosus*	Long-leaved pondweed	-	Monocotyledons	-
Potamogetaceae	*Potamogeton pectinatus*	Fennel-leaved pondweed	-	Monocotyledons	-
Potamogetaceae	*Potamogeton pusillus*	Slender pondweed	-	Monocotyledons	-
Primulaceae	*Anagallis arvensis*	Scarlet pimpernel	*	Dicotyledons	-
Primulaceae	*Lysimachia ciliata*	Fringed loosestrife	-	Dicotyledons	-
Primulaceae	*Lysimachia nummularia*	Moneywort	-	Dicotyledons	-
Primulaceae	*Lysimachia quadrifolia*	Whorled loosestrife	-	Dicotyledons	-
Primulaceae	*Lysimachia terrestris*	Swamp candles	-	Dicotyledons	-
Primulaceae	*Lysimachia thyrsifolia*	Tufted loosestrife	-	Dicotyledons	-
Primulaceae	*Trientalis borealis*	Starflower	-	Dicotyledons	-
Pyrolaceae	*Pyrola elliptica*	Elliptic shinleaf	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
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Pyrolaceae	*Pyrola rotundifolia* var. *americana*	Rounded shinleaf	-	Dicotyledons	-
Ranunculaceae	*Anemone quinquefolia* var. *quinquefolia*	Wood anemone	-	Dicotyledons	-
Ranunculaceae	*Ranunculus repens*	Creeping buttercup	*	Dicotyledons	-
Ranunculaceae	*Actaea pachypoda*	Doll's eyes	-	Dicotyledons	-
Ranunculaceae	*Anemone virginiana*	Thimbleweed	-	Dicotyledons	-
Ranunculaceae	*Aquilegia vulgaris*	European columbine	*	Dicotyledons	-
Ranunculaceae	*Caltha palustris*	Marsh-marigold	-	Dicotyledons	-
Ranunculaceae	*Actaea racemosa*	Black cohosh	-	Dicotyledons	-
Ranunculaceae	*Clematis virginiana*	Virgin's bower	-	Dicotyledons	-
Ranunculaceae	*Hepatica acutiloba*	Sharp-lobed hepatica	-	Dicotyledons	-
Ranunculaceae	*Hydrastis canadensis*	Goldenseal	-	Dicotyledons	-
Ranunculaceae	*Ranunculus abortivus*	Small-flowered crowfoot	-	Dicotyledons	-
Ranunculaceae	*Ranunculus acris*	Common buttercup	*	Dicotyledons	-
Ranunculaceae	*Ranunculus aqautilis* var. *diffusus*	White water crowfoot	-	Dicotyledons	-
Ranunculaceae	*Ranunculus hispidus* var. *caricetorum*	Swamp buttercup	-	Dicotyledons	-
Ranunculaceae	*Ranunculus hispidus* var. *hispidus*	Hispid buttercup	-	Dicotyledons	-
Ranunculaceae	*Ranunculus pensylvanicus*	Bristly crowfoot	-	Dicotyledons	-
Ranunculaceae	*Ranunculus recurvatus* var. *recurvatus*	Hooked crowfoot	-	Dicotyledons	-
Ranunculaceae	*Ranunculus sceleratus* var. *sceleratus*	Cursed crowfoot	-	Dicotyledons	-
Ranunculaceae	*Thalictrum dasycarpum*	Purple meadow-rue	-	Dicotyledons	-
Ranunculaceae	*Thalictrum dioicum*	Early meadow-rue	-	Dicotyledons	-
Rhamnaceae	*Rhamnus frangula*	European alder buckthorn	*	Dicotyledons	-
Rosaceae	*Agrimonia gryposepala*	Common agrimony	-	Dicotyledons	-
Rosaceae	*Agrimonia parviflora*	Southern agrimony	-	Dicotyledons	-
Rosaceae	*Agrimonia pubescens*	Downy agrimony	-	Dicotyledons	-
Rosaceae	*Amelanchier arborea*	Downy serviceberry	-	Dicotyledons	-
Rosaceae	*Amelanchier laevis*	Allegheny serviceberry	-	Dicotyledons	-
Rosaceae	*Amelanchier stolonifera*	Running serviceberry	-	Dicotyledons	-
Rosaceae	*Aronia prunifolia*	Chokeberry	-	Dicotyledons	-
Rosaceae	*Chaenomeles speciosa*	Flowering quince	*	Dicotyledons	-
Rosaceae	*Crataegus coccinea*	Red hawthorn	-	Dicotyledons	-
Rosaceae	*Crataegus crus-galli*	Cockspur hawthorn	-	Dicotyledons	-
Rosaceae	*Crataegus disperma*	Spreading hawthorn	-	Dicotyledons	-
Rosaceae	*Crataegus flabellata*	Fanleaf hawthorn	-	Dicotyledons	-
Rosaceae	*Crataegus intricata*	Copenhagen hawthorn	-	Dicotyledons	-
Rosaceae	*Crataegus monogyna*	Oneseed-hawthorn	*	Dicotyledons	-
Rosaceae	*Crataegus pedicellata*	Scarlet hawthorn	-	Dicotyledons	-
Rosaceae	*Crataegus phaenopyrum*	Washington hawthorn	-	Dicotyledons	-
Rosaceae	*Crataegus pruinosa*	Frosted hawthorn	-	Dicotyledons	-
Rosaceae	*Crataegus punctata*	Dotted hawthorn	-	Dicotyledons	-
Rosaceae	*Fragaria vesca*	Woodland strawberry	-	Dicotyledons	-
Rosaceae	*Fragaria virginiana*	Thick-leaved wild strawberry	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
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Rosaceae	*Geum canadense*	White avens	-	Dicotyledons	-
Rosaceae	*Geum laciniatum*	Rough avens	-	Dicotyledons	-
Rosaceae	*Geum rivale*	Water avens	-	Dicotyledons	P
Rosaceae	*Malus coronaria*	Sweet crab	-	Dicotyledons	-
Rosaceae	*Malus floribunda*	Japanese flowering crab-apple	*	Dicotyledons	-
Rosaceae	*Malus pumila*	Common apple	*	Dicotyledons	-
Rosaceae	*Potentilla canadensis*	Running five-finger	-	Dicotyledons	-
Rosaceae	*Potentilla norvegica*	Strawberry-weed	-	Dicotyledons	-
Rosaceae	*Potentilla recta*	Sulphur five-finger	-	Dicotyledons	-
Rosaceae	*Potentilla simplex*	Old-field five-finger	-	Dicotyledons	-
Rosaceae	*Prunus americana*	American plum	-	Dicotyledons	-
Rosaceae	*Prunus domestica*	European plum	*	Dicotyledons	-
Rosaceae	*Prunus mahaleb*	Mahaleb cherry	*	Dicotyledons	-
Rosaceae	*Prunus mexicana*	Mexican plum	*	Dicotyledons	-
Rosaceae	*Prunus persica*	Peach	*	Dicotyledons	-
Rosaceae	*Prunus serotina*	Wild black cherry	-	Dicotyledons	-
Rosaceae	*Prunus virginiana* var. *virginiana*	Choke-cherry	-	Dicotyledons	-
Rosaceae	*Pyrus communis*	Common pear	*	Dicotyledons	-
Rosaceae	*Pyrus pyrifolia*	Chinese pear	*	Dicotyledons	-
Rosaceae	*Rhodotypos scandens*	Jetbead	*	Dicotyledons	-
Rosaceae	*Rosa canina*	Dog rose	*	Dicotyledons	-
Rosaceae	*Rosa carolina*	Pasture rose	-	Dicotyledons	-
Rosaceae	*Rosa centifolia*	Cabbage rose	*	Dicotyledons	-
Rosaceae	*Rosa gallica*	French rose	*	Dicotyledons	-
Rosaceae	*Rosa multiflora*	Multiflora rose	*	Dicotyledons	-
Rosaceae	*Rosa muscosa*	Moss rose	*	Dicotyledons	-
Rosaceae	*Rosa palustris*	Swamp rose	-	Dicotyledons	-
Rosaceae	*Rosa setigera*	Climbing prairie-rose	-	Dicotyledons	-
Rosaceae	*Rosa wichuraiana*	Memorial rose	*	Dicotyledons	-
Rosaceae	*Rubus allegheniensis*	Common blackberry	-	Dicotyledons	-
Rosaceae	*Rubus allegheniensis* x *Rubus pensylvanicus*	Hybrid blackberry	-	Dicotyledons	-
Rosaceae	*Rubus biformispinus*	Pasture dewberry	-	Dicotyledons	-
Rosaceae	*Rubus densissimus*	Morgantown blackberry	-	Dicotyledons	-
Rosaceae	*Rubus enslenii*	Enslen's blackberry	-	Dicotyledons	-
Rosaceae	*Rubus flagellaris*	Northern dewberry	-	Dicotyledons	-
Rosaceae	*Rubus frondosus*	Yankee blackberry	-	Dicotyledons	-
Rosaceae	*Rubus hispidus*	Swamp-dewberry	-	Dicotyledons	-
Rosaceae	*Rubus idaeus* var. *strigosus*	Red raspberry	-	Dicotyledons	-
Rosaceae	*Rubus x neglectus*	Hybrid raspberry	-	Dicotyledons	-
Rosaceae	*Rubus occidentalis*	Black raspberry	-	Dicotyledons	-
Rosaceae	*Rubus occidentalis* var. *pallidus*	Black raspberry	-	Dicotyledons	-
Rosaceae	*Rubus pensylvanicus*	Pennsylvania blackberry	-	Dicotyledons	-
Rosaceae	*Rubus pubescens*	Dwarf raspberry	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
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Rosaceae	*Rubus roribaccus*	Lucretia dewberry	-	Dicotyledons	-
Rosaceae	*Sanguisorba minor*	Salad-burnet	*	Dicotyledons	-
Rosaceae	*Sorbaria sorbifolia*	False spiraea	*	Dicotyledons	-
Rosaceae	*Sorbus aucuparia*	European mountain-ash	*	Dicotyledons	-
Rosaceae	*Spiraea alba* var. *alba*	Meadowsweet	-	Dicotyledons	-
Rosaceae	*Spiraea prunifolia*	Spiraea	*	Dicotyledons	-
Rosaceae	*Spiraea tomentosa* var. *tomentosa*	Steeplebush	-	Dicotyledons	-
Rosaceae	*Spiraea vanhouttei*	Bridal wreath	*	Dicotyledons	-
Rubiaceae	*Cephalanthus occidentalis* var. *occidentalis*	Buttonbush	-	Dicotyledons	-
Rubiaceae	*Galium aparine*	Cleavers	-	Dicotyledons	-
Rubiaceae	*Galium asprellum*	Rough bedstraw	-	Dicotyledons	-
Rubiaceae	*Galium circaezans*	Wild licorice	-	Dicotyledons	-
Rubiaceae	*Galium mollugo*	False baby's breath	*	Dicotyledons	-
Rubiaceae	*Galium tinctorium* var. *tinctorium*	Southern three-lobed bedstraw	-	Dicotyledons	-
Rubiaceae	*Galium triflorum*	Sweet-scented bedstraw	-	Dicotyledons	-
Rubiaceae	*Houstonia caerulea*	Bluets	-	Dicotyledons	-
Rubiaceae	*Houstonia longifolia*	Long-leaved summer bluets	-	Dicotyledons	-
Rubiaceae	*Mitchella repens*	Partridge-berry	-	Dicotyledons	-
Salicaceae	*Populus alba*	White poplar	*	Dicotyledons	-
Salicaceae	*Populus deltoides*	Eastern cottonwood	-	Dicotyledons	-
Salicaceae	*Populus grandidentata*	Big-toothed aspen	-	Dicotyledons	-
Salicaceae	*Populus tremuloides*	Quaking aspen	-	Dicotyledons	-
Salicaceae	*Populus x smithii*	Smith's hybrid aspen	-	Dicotyledons	-
Salicaceae	*Salix alba* var. *alba*	White willow	*	Dicotyledons	-
Salicaceae	*Salix alba* var. *tristis*	Weeping willow	*	Dicotyledons	-
Salicaceae	*Salix amygdaloides*	Peach-leaf willow	-	Dicotyledons	-
Salicaceae	*Salix discolor*	Pussy willow	-	Dicotyledons	-
Salicaceae	*Salix eriocephala*	Diamond willow	-	Dicotyledons	-
Salicaceae	*Salix exigua* ssp. *interior*	Sandbar willow	-	Dicotyledons	-
Salicaceae	*Salix humilis*	Upland willow	-	Dicotyledons	-
Salicaceae	*Salix lucida*	Shining willow	-	Dicotyledons	-
Salicaceae	*Salix nigra*	Black willow	-	Dicotyledons	-
Salicaceae	*Salix purpurea*	Purpleosier willow	*	Dicotyledons	-
Salicaceae	*Salix sericea*	Silky willow	-	Dicotyledons	-
Salicaceae	*Salix x conifera*	Hybrid willow	-	Dicotyledons	-
Salicaceae	*Salix x glatfelteri*	Hybrid willow	-	Dicotyledons	-
Salicaceae	*Salix x sepulcralis*	Hybrid willow	*	Dicotyledons	-
Saxifragaceae	*Chrysosplenium americanum*	Golden saxifrage	-	Dicotyledons	-
Saxifragaceae	*Heuchera americana*	Common alum-root	-	Dicotyledons	-
Saxifragaceae	*Mitella diphylla*	Bishop's cap	-	Dicotyledons	-
Saxifragaceae	*Penthorum sedoides*	Ditch-stonecrop	-	Dicotyledons	-
Saxifragaceae	*Saxifraga pensylvanica*	Swamp-saxifrage	-	Dicotyledons	-
Saxifragaceae	*Tiarella cordifolia*	Foam-flower	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
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Scrophulariaceae	*Kickxia elatine*	Sharp-pointed cancerwort	*	Dicotyledons	-
Scrophulariaceae	*Scrophularia marilandica*	Maryland figwort	-	Dicotyledons	-
Scrophulariaceae	*Verbascum blatteria*	Moth mullein	*	Dicotyledons	-
Scrophulariaceae	*Verbascum thapsus*	Common mullein	*	Dicotyledons	-
Simaroubaceae	*Ailanthus altissima*	Tree-of-heaven	*	Dicotyledons	-
Smilacaceae	*Smilax ecirrhata*	Upright carrion-flower	-	Monocotyledons	-
Smilacaceae	*Smilax herbacea* var. *herbacea*	Carrion-flower	-	Monocotyledons	-
Smilacaceae	*Smilax hispida*	Bristly greenbrier	-	Monocotyledons	-
Smilacaceae	*Smilax rotundifolia*	Common greenbrier	-	Monocotyledons	-
Solanaceae	*Physalis heterophylla*	Clammy ground-cherry	-	Dicotyledons	-
Solanaceae	*Physalis longifolia* var. *subglabrata*	Long-leaved ground-cherry	-	Dicotyledons	-
Solanaceae	*Solanum carolinense*	Horse-nettle	*	Dicotyledons	-
Solanaceae	*Solanum dulcamara*	Bittersweet-nightshade	*	Dicotyledons	-
Solanaceae	*Solanum nigrum*	Black nightshade	-	Dicotyledons	-
Sparganiaceae	*Sparganium americanum*	Common bur-reed	-	Monocotyledons	-
Sparganiaceae	*Sparganium eurycarpum*	Giant bur-reed	-	Monocotyledons	-
Taxodiaceae	*Taxodium distichum*	Bald-cypress	-	Gymnosperms	-
Thelypteridaceae	*Phegopteris connectilis*	Long beech fern	-	Pteridophytes	P
Thelypteridaceae	*Phegopteris hexagonoptera*	Broad beech fern	-	Pteridophytes	-
Thelypteridaceae	*Thelypteris noveboracensis*	New York fern	-	Pteridophytes	-
Thelypteridaceae	*Thelypteris palustris* var. *pubescens*	Marsh fern	-	Pteridophytes	-
Tiliaceae	*Tilia americana*	Basswood	-	Dicotyledons	-
Trilliaceae (Liliaceae)	*Trillium erectum* var. *erectum*	Wake-robin	-	Monocotyledons	-
Trilliaceae (Liliaceae)	*Trillium grandiflorum*	Large white trillium	-	Monocotyledons	-
Typhaceae	*Typha angustifolia*	Narrow-leaved cat-tail	*	Monocotyledons	-
Typhaceae	*Typha latifolia*	Broad-leaved cat-tail	-	Monocotyledons	-
Typhaceae	*Typha* x *glauca*	Hybrid Cat-tail	-	Monocotyledons	-
Ulmaceae	*Ulmus americana*	American elm	-	Dicotyledons	-
Ulmaceae	*Ulmus pumila*	Siberian elm	*	Dicotyledons	-
Ulmaceae	*Ulmus rubra*	Slippery elm	-	Dicotyledons	-
Urticaceae	*Boehmeria cylindrica*	False-nettle	-	Dicotyledons	-
Urticaceae	*Laportea canadensis*	Wood-nettle	-	Dicotyledons	-
Urticaceae	*Parietaria pensylvanica*	Pennsylvania pellitory	-	Dicotyledons	-
Urticaceae	*Pilea fontana*	Marsh clearweed	-	Dicotyledons	-
Urticaceae	*Pilea pumila*	Clearweed	-	Dicotyledons	-
Urticaceae	*Urtica dioica* var. *gracilis*	Stinging nettle	-	Dicotyledons	-
Valerianaceae	*Valeriana officinalis*	Garden valerian	-	Dicotyledons	-
Verbenaceae	*Verbena hastata*	Common vervain	-	Dicotyledons	-
Verbenaceae	*Verbena simplex*	Narrowleaf vervain	-	Dicotyledons	-
Verbenaceae	*Verbena stricta*	Hoary vervain	-	Dicotyledons	-
Verbenaceae	*Verbena urticifolia*	White vervain	-	Dicotyledons	-
Violaceae	*Viola affinis*	Sand violet	-	Dicotyledons	-
Violaceae	*Viola blanda*	Sweet white violet	-	Dicotyledons	-

CAMP RAVENNA – VASCULAR PLANTS					
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Violaceae	*Viola cucullata*	Blue marsh-violet	-	Dicotyledons	-
Violaceae	*Viola hastata*	Spear-leaved violet	-	Dicotyledons	-
Violaceae	*Viola macloskeyi*	Small white violet	-	Dicotyledons	-
Violaceae	*Viola pubescens*	Common yellow violet	-	Dicotyledons	-
Violaceae	*Viola rostrata*	Long-spurred violet	-	Dicotyledons	-
Violaceae	*Viola rotundifolia*	Round-leaved violet	-	Dicotyledons	-
Violaceae	*Viola sagittata*	Arrowhead-violet	-	Dicotyledons	-
Violaceae	*Viola sororia*	Common blue violet	-	Dicotyledons	-
Violaceae	*Viola striata*	Common white violet	-	Dicotyledons	-
Violaceae	*Viola* x *brauniae*	Braun's hybrid violet	-	Dicotyledons	-
Vitaceae	*Parthenocissus quinquefolius*	Virginia-creeper	-	Dicotyledons	-
Vitaceae	*Vitis aestivalis* var. *aestivalis*	Summer-grape	-	Dicotyledons	-
Vitaceae	*Vitis aestivalis* var. *bicolor*	Summer-grape	-	Dicotyledons	-
Vitaceae	*Vitis labrusca*	Northern fox grape	-	Dicotyledons	-
Vitaceae	*Vitis riparia*	Riverbank grape	-	Dicotyledons	-
Vitaceae	*Vitis vulpina*	Frost grape	-	Dicotyledons	-
Zannichelliaceae	*Zannichellia palustris*	Horned pondweed	-	Monocotyledons	-

CAMP RAVENNA – BIRDS							
Common Name	*Scientific Name*	Species Status		Common Name	*Scientific Name*	Species Status	
		State	Federal			State	Federal
Cooper's Hawk	*Accipiter cooperii*	-	-	Yellow-breasted Chat	*Icteria virens*	-	-
Sharp-shinned Hawk	*Accipiter striatus*	SC	-	Baltimore Oriole	*Icterus galbula*	-	-
Spotted Sandpiper	*Actitis macularia*	-	-	Orchard Oriole	*Icterus spurius*	-	-
Red-winged Blackbird	*Agelaius phoeniceus*	-	-	Least Bittern	*Ixobrychus exilis*	T	-
Wood Duck	*Aix sponsa*	-	-	Dark eyed Junco	*Junco hyemalis*	SI**	-
Henslow's Sparrow	*Ammodramus henslowii*	SC	-	Northern Shrike	*Lanius excubitor*	-	-
Grasshopper Sparrow	*Ammodramus savannarum*	-	-	Herring Gull	*Larus argentatus*	-	-
American Wigeon	*Anas americana*	-	-	Ring-billed Gull	*Larus delawarensis*	-	-
Northern Shoveler	*Anas clypeata*	SI	-	Bonaparte's Gull	*Larus philadelphia*	-	-
Green-winged Teal	*Anas crecca*	SI	-	Yellow-billed Cuckoo	*Larus philadelphia*	-	-
Blue-winged Teal	*Anas discors*	-	-	Short-billed Dowitcher	*Limnodromus griscus*	-	-
Mallard	*Anas platyrhynchos*	-	-	Hooded Merganser	*Lophodytes cucullatus*	-	-
American Black Duck	*Anas rubripes*	SI	-	Red-bellied Woodpecker	*Melanerpes carolinus*	-	-
Gadwall	*Anas strepera*	SI	-	Red-headed Woodpecker	*Melanerpes erythrocephalus*	-	-
American Pipit	*Anthus rubescens*	-	-	Wild Turkey	*Meleagris gallopavo*	-	-
Golden Eagle	*Aquila chrysaetos*	-	-	Swamp Sparrow	*Melospiza georgiana*	-	-
Ruby-throated Hummingbird	*Archilochus colubris*	-	-	Lincoln's Sparrow	*Melospiza lincolnii*	-	-
Great Egret	*Ardea alba*	SC**	-	Song Sparrow	*Melospiza melodia*	-	-
Great Blue Heron	*Ardea herodias*	-	-	Red-breasted Merganser	*Mergus serrator*	-	-

CAMP RAVENNA - BIRDS							
Common Name	*Scientific Name*	Species Status		Common Name	*Scientific Name*	Species Status	
		State	Federal			State	Federal
Lesser Scaup	*Aythya affinis*	-	-	Northern Mockingbird	*Mimus polyglottos*	-	-
Redhead duck	*Aythya americana*	SI	-	Black-and-white Warbler	*Mniotilta varia*	-	-
Ring-necked Duck	*Aythya collaris*	-	-	Brown-headed Cowbird	*Molothrus ater*	-	-
Greater Scaup	*Aythya marila*	-	-	Great Crested Flycatcher	*Myiarchus crinitus*	-	-
Canvasback	*Aythya valisineria*	-	-	Whimbrel	*Numenius phaeopus*	-	-
Cedar Waxwing	*Bombycilla cedrorum*	-	-	Kentucky Warbler	*Oporornis formosus*	-	-
Ruffed Grouse	*Bonasa umbellus*	-	-	Mourning Warbler	*Oporornis philadelphia*	SI	-
American Bittern	*Botaurus lentiginosus*	E**	-	Eastern Screech-Owl	*Otus asio*	-	-
Canada Goose	*Branta canadensis*	-	-	Ruddy Duck	*Oxyura jamaicensis*	SI	-
Great Horned Owl	*Bubo virginianus*	-	-	Osprey	*Pandion haliaetus*	-	-
Bufflehead	*Bucephala albeola*	-	-	Northern Parula	*Parula americana*	-	-
Common Goldeneye	*Bucephala clangula*	-	-	Tufted Titmouse	*Parus bicolor*	-	-
Red-tailed Hawk	*Buteo jamaicensis*	-	-	House Sparrow	*Passer domesticus*	-	-
Red-shouldered Hawk	*Buteo lineatus*	-	-	Savannah Sparrow	*Passerculus sandwichensis*	-	-
Broad-winged Hawk	*Buteo platypterus*	-	-	Fox Sparrow	*Passerella iliaca*	-	-
Green Heron	*Butorides virescens*	-	-	Indigo Bunting	*Passerina cyanea*	-	-
Dunlin	*Calidris alpine*	-	-	Double-crested Cormorant	*Phalacrocorax auritus*	-	-
Pectoral Sandpiper	*Calidris melanotos*	-	-	Ring-necked Pheasant	*Phasianus colchicus*	-	-
Least Sandpiper	*Calidris minutilla*	-	-	Rose-breasted Grosbeak	*Pheucticus ludovicianus*	-	-
Semipalmated Sandpiper	*Calidris pusilla*	-	-	Downy Woodpecker	*Picoides pubescens*	-	-
Northern Cardinal	*Cardinalis cardinalis*	-	-	Hairy Woodpecker	*Picoides villosus*	-	-
Pine Siskin	*Carduelis pinus*	SI	-	Eastern Towhee	*Pipilo erythrophthalmus*	-	-
American Goldfinch	*Carduelis tristis*	-	-	Scarlet Tanager	*Piranga olivacea*	-	-
House Finch	*Carpodacus mexicanus*	-	-	Snow Bunting	*Plectrophenax nivalis*	-	-
Purple Finch	*Carpodacus purpureous*	SI	-	Horned Grebe	*Podiceps auritus*	-	-
Turkey Vulture	*Cathartes aura*	-	-	Pied-billed Grebe	*Podilymbus podiceps*	-	-
Veery	*Catharus fuscescens*	-	-	Black-capped Chickadee	*Poecile atricapillus*	-	-
Hermit Thrush	*Catharus guttatus*	SI**	-	Blue-gray Gnatcatcher	*Polioptila caerulea*	-	-
Gray-cheeked Thrush	*Catharus minimus*	-	-	Vesper sparrow	*Pooecetes gramineus*	-	-
Swainson's Thrush	*Catharus ustulatus*	-	-	Sora	*Porzana carolina*	SC	-
Brown Creeper	*Certhia americana*	SI	-	Purple Martin	*Progne subis*	-	-
Belted Kingfisher	*Ceryle alcyon*	-	-	Prothonotary Warbler	*Protonotaria citrea*	SC	-
Chimney Swift	*Chaetura pelagica*	-	-	Common Grackle	*Quiscalus quiscula*	-	-
Semipalmated Plover	*Charadrius semipalmatus*	-	-	Virginia Rail	*Rallus limicola*	SC	-
Killdeer	*Charadrius vociferus*	-	-	Ruby-crowned Kinglet	*Regulus calendula*	-	-
Snow Goose	*Chen caerulescens*	-	-	Golden-crowned Kinglet	*Regulus satrapa*	SI	-
Common Nighthawk	*Chordeiles minor*	-	-	Bank Swallow	*Riparia riparia*	-	-

CAMP RAVENNA - BIRDS							
Common Name	*Scientific Name*	Species Status		Common Name	*Scientific Name*	Species Status	
		State	Federal			State	Federal
Northern Harrier	*Circus cyaneus*	E	-	Eastern Phoebe	*Sayornis phoebe*	-	-
Sedge Wren	*Cistothorus platensis*	SC	-	American Woodcock	*Scolopax minor*	-	-
Marsh Wren	*Cistothrorus palustris*	SC	-	Black-billed Cuckoo	*Scolopax minor*	-	-
Evening Grosbeok	*Coccothraustes vespertinus*	-	-	Ovenbird	*Seiurus aurocapillus*	-	-
Northern Flicker	*Colaptes auratus*	-	-	Louisiana Waterthrush	*Seiurus motacilla*	-	-
Northern Bobwhite	*Colinus virginianus*	SC	-	Northern Waterthrush	*Seiurus noveboracensis*	SI	-
Rock Dove	*Columba livia*	-	-	American Redstart	*Setophaga ruticilla*	-	-
Olive-sided Flycatcher	*Contopus borealis*	-	-	Eastern Bluebird	*Sialia sialis*	-	-
Eastern Wood-Pewee	*Contopus virens*	-	-	Red-breasted Nuthatch	*Sitta canadensis*	SI	-
American Crow	*Corvus brachyrhynchos*	-	-	White-breasted Nuthatch	*Sitta carolinensis*	-	-
Blue Jay	*Cyanocitta cristata*	-	-	Yellow-bellied Sapsucker	*Sphyrapicus varius*	SC	-
Trumpeter Swan	*Cygnus buccinator*	T**	-	Dickcissel	*Spiza americana*	-	-
Tundra Swan	*Cygnus columbianus*	-	-	American Tree Sparrow	*Spizella arborea*	-	-
Mute Swan	*Cygnus olor*	-	-	Chipping Sparrow	*Spizella passerina*	-	-
Black-throated Blue Warbler	*Dendroica caerulescens*	SI	-	Field Sparrow	*Spizella pusilla*	-	-
Bay-breasted Warbler	*Dendroica castanea*	-	-	N. Rough-winged Swallow	*Stelgidopteryx serripennis*	-	-
Cerulean Warbler	*Dendroica cerulea*	SC	-	Caspian tern	*Sterna caspia*	-	-
Yellow-rumped Warbler	*Dendroica coronata*	-	-	Barred Owl	*Strix varia*	-	-
Blackburnian Warbler	*Dendroica fusca*	SI	-	Eastern Meadowlark	*Sturnella magna*	-	-
Magnolia Warbler	*Dendroica magnolia*	SI	-	European Starling	*Sturnus vulgaris*	-	-
Palm Warbler	*Dendroica palmarum*	-	-	Tree Swallow	*Tachycineta bicolor*	-	-
Chestnut-sided Warbler	*Dendroica pensylvanica*	-	-	Carolina Wren	*Thryothorus ludovicianus*	-	-
Yellow Warbler	*Dendroica petechia*	-	-	Brown Thrasher	*Toxostoma rufum*	-	-
Pine Warbler	*Dendroica pinus*	-	-	Lesser Yellowlegs	*Tringa flavipes*	-	-
Blackpoll Warbler	*Dendroica striata*	-	-	Greater Yellowlegs	*Tringa melanoleuca*	-	-
Cope May Warbler	*Dendroica tigrina*	-	-	Solitary Sandpiper	*Tringa solitaria*	-	-
Black-throated Green Warbler	*Dendroica virens*	-	-	House Wren	*Troglodytes aedon*	-	-
Bobolink	*Dolichonyx oryzivorus*	SC	-	Winter Wren	*Troglodytes troglodytes*	SI	-
Pileated Woodpecker	*Dryocopus pileatus*	-	-	American Robin	*Turdus migratorius*	-	-
Gray Catbird	*Dumetella carolinensis*	-	-	Eastern Kingbird	*Tyrannus tyrannus*	-	-
Little Blue Heron	*Egretta caerulea*	-	-	Barn Owl	*Tyto alba*	T	-
Alder Flycatcher	*Empidonax alnorum*	-	-	Orange-crowned Warbler	*Vermivora celata*	-	-
Yellow-bellied Flycatcher	*Empidonax flaviventris*	-	-	Golden-winged Warbler	*Vermivora chrysoptera*	EXP	-
Least Flycatcher	*Empidonax minimus*	SI	-	Lawrence's Warbler	*Vermivora lawrencii*	-	-
Willow Flycatcher	*Empidonax traillii*	-	-	Brewster's Warbler	*Vermivora leucobronchialis*	-	-
Horned Lark	*Eremophila alpestris*	-	-	Tennessee Warbler	*Vermivora peregrina*	-	-
Rusty Blackbird	*Euphagus carolinus*	-	-	Blue-winged Warbler	*Vermivora pinus*	-	-

CAMP RAVENNA – BIRDS							
Common Name	*Scientific Name*	Species Status		Common Name	*Scientific Name*	Species Status	
		State	Federal			State	Federal
Merlin	*Falco columbarius*	-	-	Nashville Warbler	*Vermivora ruficapilla*	-	-
American Kestrel	*Falco sparverius*	-	-	Yellow-throated Vireo	*Vireo flavifrons*	-	-
American Coot	*Fulica americana*	-	-	Warbling Vireo	*Vireo gilvus*	-	-
Wilson's Snipe	*Gallinago delicata*	SI	-	White-eyed Vireo	*Vireo griseus*	-	-
Common Snipe	*Gallinago gallinago*	-	-	Red-eyed Vireo	*Vireo olivaceus*	-	-
Common Moorhen	*Gallinula chloropus*	SC	-	Philadelphia Vireo	*Vireo philadelphicus*	-	-
Common Loon	*Gavia immer*	-	-	Blue-headed Vireo	*Vireo solitarius*	-	-
Common Yellowthroat	*Geothlypis trichas*	-	-	Canada Warbler	*Wilsonia canadensis*	SI	-
Sandhill Crane	*Grus canadensis*	E**	-	Hooded Warbler	*Wilsonia citrina*	-	-
Blue Grosbeak	*Guiracea caerulea*	-	-	Wilson's Warbler	*Wilsonia pusilla*	-	-
Bald Eagle	*Haliaeetus leucocephalus*	-	SC	Mourning Dove	*Zenaida macroura*	-	-
Cliff Swallow	*Hirundo prryhonata*	-	-	White-throated Sparrow	*Zonotrichia albicollis*	-	-
Barn Swallow	*Hirundo rustica*	-	-	White-crowned Sparrow	*Zonotrichia leucophryss*	-	-
Wood Thrush	*Hylocichla mustelinus*	-	-				

CAMP RAVENNA – FISH							
Common Name	*Scientific Name*	Species Status		Common Name	*Scientific Name*	Species Status	
		State	Federal			State	Federal
Rock Bass	*Ambloplites rupestris*	-	-	Pumpkinseed sunfish	*Lepomis gibbosus*	-	-
Black Bullhead	*Ameiurus melas*	-	-	Warmouth Sunfish	*Lepomis gulosis*	-	-
Yellow Bullhead	*Ameiurus natalis*	-	-	Bluegill Sunfish	*Lepomis macrochirus*	-	-
Bowfin	*Amia calva*	-	-	Striped Shiner	*Luxilus chrysocephalus*	-	-
Eastern Sand Darter	*Ammocrypta pellucida*	-	-	Common Shiner	*Luxilus cornutus*	-	-
Central Stoneroller	*Campostoma anomalum*	SC	-	Largemouth Bass	*Micropterus salmoides*	-	-
White Sucker	*Catostomus commersoni*	-	-	Spotted Sucker	*Minytrema melanops*	-	-
Redside Dace	*Clinostomus elongates*	-	-	Golden Redhorse	*Moxostoma erythrurum*	-	-
Mottled Sculpin	*Cottus bairdi*	-	-	Golden Shiner	*Notemigonus crysoleucas*	-	-
Grass Carp	*Ctenopharyngodon idella*	-	-	Silverjaw Minnow	*Notropis buccatus*	-	-
Brook Stickleback	*Culaea inconstans*	-	-	Spotfin Shiner	*Notropis spilopterus*	-	-
Common Carp	*Cyprinus carpio*	-	-	Sand Shiner	*Notropis stramineus*	-	-
Gizzard Shad	*Dorosoma cepedianum*	-	-	Rainbow Trout	*Oncorhynchus mykiss*	-	-
Grass Pickerel	*Esox americanus vermicula*	-	-	Logperch Darter	*Percina caprodes*	-	-
Greenside Darter	*Etheostoma blennoides*	-	-	Yellow Perch	*Perea flavescens*	-	-
Rainbow Darter	*Etheostoma caeruleum*	-	-	Blackside Darter	*Pereina maculata*	-	-
Fantail Darter	*Etheostoma flabellare*	-	-	S. Redbelly Dace	*Phoxinus erythrogaster*	-	-
Johnny Darter	*Etheostoma nigrum*	-	-	Fathead Minnow	*Pimephales promelas*	-	-
Banded Darter	*Etheostoma zonale*	-	-	Bluntnose Minnow	*Pimphales notatus*	-	-

CAMP RAVENNA – FISH							
Common Name	*Scientific Name*	Species Status		Common Name	*Scientific Name*	Species Status	
		State	Federal			State	Federal
Hybrid x Minnow	*HYBRID*	-	-	White Crappie	*Pomoxis annularis*	-	-
Hybrid x Sunfish	*HYBRID*	-	-	Black Crappie	*Poxomis nigromaculatus*	-	-
Northern Hog Sucker	*Hypentelium nigricans*	-	-	Blacknose Dace	*Rhinichthys atratulus*	-	-
Mountain. Brook Lamprey	*lchthyomyzon greeleyi*	E	-	Creek Chub	*Semotilus atromaculatus*	-	-
Channel Catfish	*lctalurus punctatus*	-	-	Central Mudminnow	*Umbra limi*	-	-
Green Sunfish	*Lepomis cyanellus*	-	-				

CAMP RAVENNA – AVIAN MAMMALS			
Common Name	*Scientific Name*	Species Status	
		State	Federal
Big brown	*Eptesicus fuscus*	SC	-
Little brown	*Myotis lucifugus*	SC	-
Eastern red	*Lasiurus borealis*	SC	-
Northern long-eared	*Myotis septentrionalis*	SC	PL
Hoary	*Lasiurus cinereus*	SC	-
Tri-colored	*Perimyotis subflavus*	SC	-

CAMP RAVENNA – LAND MAMMALS			
Common Name	*Scientific Name*	State Status	
		State	Federal
American Beaver	*Castor canadensis*	-	-
Bobcat	*Felis rufus*	T	-
Coyote	*Canis latrans*	-	-
Deer mouse	*Peromyscus maniculatus*	SC	-
Eastern Chipmunk	*Tamias striatus*	-	-
Eastern Cottontail Rabbit	*Sylvilagus floridanus*	-	-
Eastern Fox Squirrel	*Sciurus niger*	-	-
Eastern Grey Squirrel	*Sciurus carolinensis*	-	-
Eastern Mole	*Scalopus aquaticus*	-	-
Gray fox	*Urocyon cinereoargenteus*	-	-
Hairy-tailed Mole	*Parascalops breweri*	-	-
House Cat	*Felis catus*	-	-
Least Shrew	*Cryptotis parva*	-	-
Least Weasel	*Mustela nivalis*	-	-
Long-tailed Weasel	*Mustela frenata*	-	-
Masked Shrew	*Sorex cinereus*	-	-
Meadow Jumping mouse	*Zapus hudsonius*	-	-
Meadow Vole	*Microtus pennsylvanicus*	-	-
Mink	*Mustela vison*	-	-
Muskrat	*Ondatra zibethicus*	-	-

CAMP RAVENNA – LAND MAMMALS			
Common Name	*Scientific Name*	State Status	
		State	Federal
Northern Short-tail Shrew	*Blarina brevicauda*	-	-
Opossum	*Didelphis virginiana*	-	-
Pygmy Shrew	*Sorex hoyi*	SC	-
Raccoon	*Procyon lotor*	-	-
Red Fox	*Vulpes vulpes*	-	-
Red Squirrel	*Tamiasciurus hudsonicus*	-	-
River Otter	*Lutra canadensis*	-	-
Southern Bog Lemming	*Svnaptomys cooperi*	SC	-
Southern Flying Squirrel	*Glaucomys volans*	-	-
Star-nosed Mole	*Condylura cristata*	SC	-
Striped Skunk	*Mephitis mephitis*	-	-
White-footed mouse	*Peromyscus leucopus*	-	-
White-tailed deer	*Odocoileus virginianus*	-	-
Woodchuck	*Marmota monax*	-	-
Woodland Jumping mouse	*Napaeozapus insignis*	SC	-

CAMP RAVENNA – CRAYFISH			
Common Name	*Scientific Name*	State Status	
		State	Federal
Allegheny crayfish	*Orconectes obscurus*	-	-
Digger crayfish	*Fallicambarus fodiens*	-	-
Rock crayfish	*Cambarus bartoni carinirostris*	-	-
White River crayfish	*Procambarus acutus acutus*	-	-

CAMP RAVENNA – MOLLUSCS			
Common Name	*Scientific Name*	State Status	
		State	Federal
Common floater	*Pyganodon grandis grandis*	-	-
Creek heelsplitter	*Lasmigona compressa*	SC	-
Creek shell	*Anodontoides ferussacianus*	-	-
Creeper	*Strophitus undulatus undulatus*	-	-
Fat mucket	*Lampsilis radiata luteola*	-	-
Fragile papershell	*Utterbackia imbecillis*	-	-
Spike	*Elliptio dilatata*	-	-
White heelsplitter	*Lasmigona complanata complanata*	-	-
Grooved fingernail clam	*Sphaerium simile*	-	-
Lake fingernail clam	*Musculium lacustre*	-	-
Long fingernail clam	*Musculium transversum*	-	-
Pond fingernail clam	*Musculium securis*	-	-
Rhomboid fingernail clam	*Sphaerium rhomboideum*	-	-

CAMP RAVENNA – MOLLUSCS			
Common Name	*Scientific Name*	State Status	
		State	Federal
Ridged-beak pea clam	*Pisidium compressum*	-	-
River fingernail clam	*Sphaerium fabale*	-	-
Striated fingernail clam	*Sphaerium striatinum*	-	-
Swamp fingernail clam	*Musculium partumeium*	-	-
Ubiquitous pea clam	*Pisidium casertanum*	-	-
Ash gyro	*Gyraulus parvus*	-	-
Banded mystery snail	*Vivparus georgianus*	-	-
Fragile ancylid	*Ferrissia fragilis*	-	-
Marsh rams-horn	*Planorbella trivolvis trivolvis*	-	-
Mimic lymnaea	*Pseudosuccinea columella*	-	-
Mud amnicola	*Amnicola limosa*	-	-
Pointed campeloma	*Campeloma decisum*	-	-
Pygmy fossaria	*Fossaria parva*	-	-
Slender walker	*Pomatiopsis lapidaria*	-	-
Tadpole physa	*Physella gyrina*	-	-
Thicklip rams-horn	*Planorbella armigera armigera*	-	-
Two-ridge rams-horn	*Heliosoma anceps anceps*	-	-
Armed snaggletooth	*Gastrocopta armifera*	-	-
Baffled threetooth	*Triodopsis fraudulenta*	-	-
Blunt amber snail	*Oxyloma retusa*	-	-
Bottleneck snaggletooth	*Gastrocopta contracta*	-	-
Bright glyph	*Glyphyalinia wheatleyi*	-	-
Bronze pinecone	*Strobilops aenea*	-	-
Brown hive	*Euconulus fulvus*	-	-
Carolina mantle slug	*Philomycus carolinianus*	-	-
Carved glyph	*Glyphyalinia indentata*	-	-
Comb snaggletooth	*Gastrocopta pentodon*	-	-
Common button	*Mesomphix vulgauts*	-	-
Compound coil	*Helicodiscus parallelus*	-	-
Costate vallonia	*Vallonia costata*	-	-
Dentate supercoil	*Paravitrea multidentata*	-	-
Domed disc	*Discus patulus*	-	-
Fine-ribbed striate	*Striatura milium*	-	-
Flamed disc	*Anguispira alternata*	-	-
Forest disc	*Discus cronkhitei*	-	-
Foster mantle slug	*Pallifera fosteri*	-	-
Glossy pillar	*Cochlicopa lubrica*	-	-
Gray-foot lancetooth	*Haplotrema concavum*	-	-
Hairly slitmouth	*Stenotrema hirsutum*	-	-
Lovely vallonia	*Vallonia pulchella*	-	-
Maze pmecone	*Strobilops labyrinthica*	-	-

CAMP RAVENNA – MOLLUSCS			
Common Name	*Scientific Name*	State Status	
		State	Federal
Minute gem	*Hawaiia minuscule*	-	-
Northern threetooth	*Triodopsis tridentata*	-	-
Obese thorn	*Carychium exiguum*	-	-
Orange-banded arion	*Arion fasciatus*	-	-
Oval amber snail	*Succinea ovalis*	-	-
Ovate vertigo	*Vertigo ovata*	-	-
Plain button	*Mesomphix inornatus*	-	-
Quick glass	*Zonitoides arboreus*	-	-
Redfoot mantle slug	*Pallifera ohioensis*	-	-
Sculptured glyph	*Glyphyalinia rhoadsi*	-	-
Small spot	*Punctum minutissimum*	-	-
Suboval ambersnail	*Catinella avera*	-	-
Upland pill snail	*Euchemotrema fraternum*	-	-
Variable vertigo	*Vertigo gouldi*	-	-
White snaggletooth	*Gastrocopta tappaniana*	-	-
Whitelip	*Neohelix albolabris*	-	-
White-lip dagger	*Pupoides albilabris*	-	-
White-lip globe	*Mesodon thyroidus*	-	-
Winding mantle slug	*Philomycus flexuolaris*	-	-
Wing snaggletooth	*Gastrocopta procera*	-	-

CAMP RAVENNA – REPTILES AND AMPHIBIANS			
Common Name	*Scientific Name*	State Status	
		State	Federal
Common Mudpuppy	*Necturus maculosus*	-	-
Red-Spotted Newt	*Notophthalmus v. viridescens*	-	-
Jefferson Salamander	*Ambystoma jeffersonianum*	-	-
Northern Dusky Salamander	*Desmognathus fuscus*	-	-
Allegheny Dusky Salamander	*Desmognathus ochrophaeus*	-	-
Northern Two-Lined Salamander	*Eurycea bislineata*	-	-
Four-toed Salamander	*Hemidactylium scutatum*	SC	-
Northern Redback Salamander	*Plethodon cinereus*	-	-
Northern Redback Salamander (erythristic phase)	*Plethodon cinereus (red form)*	-	-
Northern Slimy Salamander	*Plethodon glutinosus*	-	-
Northern Red Salamander	*Pseudotriton r. ruber*	-	-
Eastern American Toad	*Bufo a. americanus*	-	-
Western Chorus Frog	*Pseudacris triseriata*	-	-
Northern Spring Peeper	*Pseudacris c. crucifer*	-	-
Gray Treefrog	*Hyla versicolor*	-	-
Bullfrog	*Lithobates catesbeiana*	-	-
Green Frog	*Lithobates clamitans melanota*	-	-

CAMP RAVENNA – REPTILES AND AMPHIBIANS			
Common Name	*Scientific Name*	State Status	
		State	Federal
Pickerel Frog	*Lithobates palustris*	-	-
Northern Leopard Frog	*Lithobates pipiens*	-	-
Wood Frog	*Lithobates sylvatica*	-	-
Five-lined Skink	*Plestiodon fasciatus*	-	-
Eastern Box Turtle	*Terrapene c. carolina*	SC	-
Common Snapping Turtle	*Chelydra s. serpentina*	-	-
Midland Painted Turtle	*Chrysemys picta marginata*	-	-
Northern Water Snake	*Nerodia s. sipedon*	-	-
Northern Brown Snake	*Storeria d. dekayi*	-	-
Northern Red-bellied Snake	*Storeria o. occipitomaculata*	-	-
Eastern Garter Snake	*Thamnophis s. sirtalis*	SC	-
Eastern Ribbon Snake	*Thamnophis s. sauritus*	-	-
Smooth Green Snake	*Opheodrys vernalis*	SC	-
Northern Black Racer	*Coluber c. constrictor*	-	-
Midland Rat Snake	*Elaphe spiloides*	-	-
Eastern Milk Snake	*Lampropeltis t. triangulum*	-	-

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Aderidae/Euglenidae- Ant-Like Leaf Beetles	*Elonus basalis* (LeConte)
	Zonates fasciatus (Melsheimer)
	Zonates subfasciatus (LeConte)
Alleculidae- Comb-clawed Bark Beetles	*Canochroa fulginosa* (Melsheimer)
	Isomira sp.
	Mycetochara sp.
Anobiidae- Death Watch Beetles	*Dorcatoma setulosum* LeConte
	Dorcatoma falli (White)
	Hadrobregmus notatus (Say)
	Hemicoelus carinatus (Say)
	Oligamerus obtusus LeConte
	Priobium sericeus (Say)
	Ptilinus ruficornis (Say)
Anthicidae- Antlike Flower Beetles	*Anthicus cervinus* (La Ferte)
	Anthicus ephippium LaFerte
	Ischyropalpus sp.
	Omonadus floralis (L.)
Anthribidae Fungus Weevils	*Euparius marmoreus* (Olivier)
	Eusphyrus walshi (LeConte)
	Ormiscus saltator LeConte
	Trigonorhinus rotundatus (LeConte)

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Biphyllidae- False Skin Beetles	*Diplocoelus brunneus* LeConte
Bostrichidae- Branch and Twig Beetles	*Xylobiops basilare* (Say)
	Zylobiops basilare (Say)
Buprestidae- Flathead or Metallic Wood Borers Beetles	*Agrilus aurichalceus* Redtenbacher
	Agrilus bilineatus bilineatus (Weber)
	Agrilus obsoletuguttatus Gory
	Agrilus putillus Say
	Agrilus ruficollis (F.)
	Agrilus spp.
	Brachys aerosus Melsheimer
	Chrysobothris adelpha (Gemminger & Harold)
	Chrysobothris femorata (Oliver)
	Chrysobothris rugosiceps Melsheimer
	Taphrocerus gracilis (Say)
	Taphrocerus nicolayi (Obenberger)
Byturidae- Fruitworm Beetles	*Byturus unicolor* Say
Cantharidae- Soldier Beetles	*Pacificantha rotundicollis* (Say)
	Silis latilobus Blatchley
	Silis spp.
Carabidae- Ground and Tiger Beetles	*Acupalpus carus* (LeConte)
	Acupalpus indistinctus Dejean
	Acupalpus partiarius (Say)
	Acupalpus pauperculus Dejean
	Acupalpus rectangulus Chaudoir
	Agonum aeruginosum Dejean
	Agonum extensicolle (Say)
	Agonum fidele Casey
	Agonum harrisii LeConte
	Agonum lutulentum (LeConte)
	Agonum moerens (Dejean)
	Agonum placidum (Say)
	Agonum tenue (LeConte)
	Amara angustata (Say)
	Amara cupreolata (Putzeys)
	Amara familiaris (Duftschmid)
	Amara impuncticollis (Say)
	Amara pallipes Kirby
	Amara pennsylvanica Hayward
	Amphasia interstitialis (Say)
	Amphasia sericea (Harris)

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Carabidae- Ground and Tiger Beetles	*Anisodactylus discoideus* Dejean
	Anisodactylus nigerrimus (Dejean)
	Anisodactylus sanctaecrucis (F.)
	Bembidion affme Say
	Bembidion frontale (LeConte)
	Bembidion graciliforme Hayward
	Bembidion impotens Casey
	Bembidion inaequale Say
	Bembidion lacunarium (Zimmermann)
	Bembidion nigrum Say
	Bembidion patruele Dejean
	Bembidion rapidum (LeConte)
	Bembidion semistriatum (Haldeman)
	Bradycellus badipennis (Haldeman)
	Bradycellus nigriceps LeConte
	Calathus gregarius (Say)
	Calleida punctata LeConte
	Calosoma frigidum Kirby
	Chlaenius impunctifrons Say
	Chlaenius tricolor Dejean
	Cicindela duodecimguttata Dejean
	Cicindela punctulata Olivier
	Cicindela repanda Dejean
	Cicindela rufiventris Dejean
	Cicindela sexguttata F.
	Clivina americana (Dejean)
	Clivina bipustulata (F.)
	Clivina dentipes Dejean
	Clivina impressifrons (LeConte)
	Coptodera aerata Dejean
	Cyclotrachelus sodalis sodalis (LeConte)
	Cymindis americanus Dejean
	Cymindis cribricollis Dejean
	Cymindis limbatus Dejean
	Cymindis platicollis (Say)
	Dicaelus politus Dejean
	Dromius piceus Dejean
	Dyschirus sphaericollis Say
	Elaphrus ruscarius Say
	Elaphorus xanthopus (Dejean)

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Carabidae- Ground and Tiger Beetles	*Elaphtopus anceps* (LeConte)
	Galeritajanus (F.)
	Gastrellarius honestus (Say)
	Harpalus compar LeConte
	Harpalus pensylvanicus (DeGeer)
	Harpalus puncticeps (Stephens)
	Lebia analis Dejean
	Lebia atriventris Say
	Lebia fuscata Dejean
	Lebia grandis Hentz
	Lebia lobulata
	Lebia ornata (Say)
	Lebia solea Hentz
	Lebia tricolor Say
	Lebia viridis Say
	Mioptachys flavicauda (Say)
	Nebria lacustris Casey
	Notiobia teminata (Say)
	Notiophilus aeneus (Herbst)
	Omophron americanum Dejean
	Ophonus punticeps (Stephens)
	Paratachys oblitus (Casey)
	Paratachys proximus (Say)
	Paratachys pumilus (Dejean) or *potomaca* (Erwin)
	Platynus decentis (Say)
	Platynus hypolithos (Say)
	Platynus tenuicollis (LeConte)
	Plochionus timidus Haldeman
	Poecilus lucublandus (Say)
	Pterostichus adoxus (Say)
	Pterostichus atratus (Newman)
	Pterostichus femoralis (Kirby)
	Pterostichus pensylvanicus LeConte
	Pterostichus stygicus (Say)
	Pterostichus tristis (Dejean)
	Selenophorus hylacis (Say)
	Selenophorus opalinus (LeConte)
	Sphaeroderus stenostomus lecontei Dejean
	Stenolophus comma (F.)
	Stenolophus conjuctus (Say)

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Carabidae- Ground and Tiger Beetles	*stenolophus dissimilis* Dejean
	Stenolophus lecontei (LeConte)
	Stenolophus ochropezus (Say)
	Synuchus impuncatatus (Say)
	Trichotichnus autumnalis (Say)
	Xestonotus lugubris (Dejean)
Cerambycidae- Longhorned Beetles	*Analeptura lineola* (Say)
	Bellamira scalaris (Say)
	Brachysornida bivittata (Say)
	Clytus ruricola (Oliver)
	Cyrtophorus verrucosus LeConte)
	Doraschema alternatum (Say)
	Euderces picipes picipes (F.)
	Eupogonius pauper LeConte
	Gaurotes cyanipennis (Say)
	Grammoptera haematites (Newman)
	Grammoptera subargentata (Kirby)
	Liopinus alpha (Say)
	Liopinus punctatus (Haldeman)
	Megacyllene caryae (Gahan)
	Megacyllene robiniae (Forster)
	Neoclytus acuminatua acuminatus (F.)
	Orthosoma brunneum (Forster)
	Parandra (Neandra) *brunnea brunnea* (F.)
	Psenocerus supernotatus (Say)
	Stictoleptura canandensis canandensis (Olivier)
	Strangalepta abbreviata (Germar)
	Strangalia luteicornis (Fabricius)
	Strophiona nitens (Forster)
	Tetraopes tetrophthalmus (Foster)
	Trachysida mutabilis (Newman)
	Tylonotus bimaculatus (Halderman)
	Typocerus acuticauda acuticauda (Casey)
	Typocerus velutinus velutinus (Olivier)
	Xylotrechus colonus (F.)
Cerylonidae- Cerylonid Beetles	*Cerylon castaneum* (Say)
	Cerylon unicolor
	Philothermus glabriculus (LeConte)
Chrysomelidae- Leaf Beetles	*Altica* spp.
	Baliosus nervosus (Panzer)

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Chrysomelidae- Leaf Beetles	*Brachycoryna melsheimeri* (Crotch)
	Brachypmoea margaretae (Schultz)
	Calligrapha multipunctata bigsbyana (Kirby)
	Calligrapha philadelphica (L.)
	Capraita circumdata (Randall)
	Capraita subvittata (Horn)
	Cerotoma trifurcata (Forster)
	Chaetocnema denticulata (Illiger)
	Chaetocnema fuscata White
	Chaetocnema pulicaria Melsheimer
	Chrysochus auratus (F.)
	Chrysolina auripennis (Say)
	Crepidodera browni Parry
	Crepidodera nana (Say)
	Crepidodera violacea (Melsheimer)
	Cryptocephalus venustus (F.)
	Diabrotica undecimpunctata howardi Barber
	Disonycha pensylvanica (Iliiger)
	Donacia sp.
	Exema canadensis Pierce
	Exema sp.
	Galerucella nymphaeae (L.)
	Kuschelina miniata (F.)
	Longitarsus sp.
	Luperaltica nigriplapis (LeConte)
	Luperaltica senilis (Say)
	Mantura chrysanthemi (Koch)
	Microrhopala sp.
	Microrhopala vittata (F.)
	Odontota sp.
	Odonata dorsalis (Thunberg)
	Ophraella conferta (LeConte)
	Ophraella cribrata (LeConte)
	Ophraella notata (F.)
	Orsodacne atra (Ahrens)
	Orthaltica copalina (F.)
	Pachybrachys sp.
	Paria spp.
	Paria thoracica (Melsheimer)
	Phylotreta sp.

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Chrysomelidae- Leaf Beetles	*Plateumaris shoemaker* (Schaeffer)
	Rhabdopterus praetextus (Say)
	Scelolyperus sp. probably Liriophilus Wilcox
	Strabala rufa (Illiger)
	Syneta ferruginea (Germar)
	Systena blanda Melsheimer
	Systena marginalis (Illiger)
	Tricholochmaea sp.
	Tymnes tricolor (F.)
	Tymnes metasternalis Crotch
Ciidae- Tree Fungus Beetles	*Cis fuscipes* Mellie
	Cis levettei (Casey)
	Orthocis punctatus (Mellie)
Cleridae- Checkered Beetles	*Enoclerus nigripes* (Say)
	Necrobia rufipes DeGeer
	Necrobia violacea (L.)
	Neorthopleura thoracica (Say)
	Placopterus thoracicus (Olivier)
	Thanasimus dubius (Fabricius)
	Zenodosus sanguineus (Say)
Coccinellidae- Lady Beetles	*Brachiacantha rotunda* Gordon
	Chilocorus stigma (Say)
	Coccinella septempunctata L.
	Coleomegilla maculata lengi Timberlake
	Cycloneda munda (Say)
	Harmonia axyridis (Pallas)
	Hippodamia convergens Guerin
	Hippodamia parenthesis (Say)
	Hyperaspis sp.
	Psyllobora vigintimaculata (Say)
Colydiidae- Cylindrical Bark Beetles	*Colydium lineola* (Say)
Corylophidae- Minute Fungus Beetles	*Molamba* sp.
Cryptophagidae- Silken Fungus Beetles	*Atomaria (Anchicera)* spp.
	Caenoscelis nr. ferruginea Sahlberg
	Cryptophagus ne. croceus Zimmerman
	Cryptophagus setulosus Sturm
	Cryptophagus sp.
	Telmatophilus americanus (LeConte)
Cucujidae- Flat Bark Beetles	*Cathartosilvanus imbellis* LeConte
	Catogenus rufus (F.)

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Cucujidae- Flat Bark Beetles	*Charaphloeus adjustus* (LeConte)
	Cucujus clavipes F.
	Laemophloeus biguttatus (Say)
	Laemophloeus fasciatus Melsheimer
	Laemophloeus megacephalus Grouvelle
	Pediacus fuscus Erichson
	Silvanus muticus Sharp
	Uleiota dubius (F.)
Cupedidae- Reticulated Beetles	*Cupes capitatus* F.
Curculionidae- Weevils or Snout Beetles	*Acalyptus carpini* (Herbst)
	Acoptus suturalis LeConte
	Anthonomus consirnilis Dietz
	Anthonomus subguttatus Dietz
	Anthonomus spp.
	Apion herculanum Smith
	Apion sp.
	Attelabus bipustulatus F.
	Bagous bituberosus LeConte
	Bagous planatus LeConte
	Bagous sp.
	Baris sp.
	Barypeithes pellucidus (Boheman)
	Caulophilus dubius (Horn)
	Ceutorhynchus septentrionalis Gyllenhall
	Conotrachelus affinis Boheman
	Conotrachelus anaglypticus Say
	Conotrachelus aratus Germar
	Conotrachelus elegans (Say)
	Conotrachelus nenuphar (Herbst)
	Conotrachelus posticatus Boheman
	Cossonus impressifrons Boheman
	Cyrtopistomus castaneus Roelofs
	Cryptorhynchus tristis LeConte
	Dirabus rectirostris (LeConte)
	Dryophthornus americanus Bedel
	Dorytomus imbecillus Faust
	Dorytomus laticollis LeConte
	Dorytomus vagenotatus (Casey)
	Euparius marmoreus Olivier
	Eurhoptus pyriformis LeConte

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Curculionidae- Weevils or Snout Beetles	*Glacianus panaitger* Gyllenhall
	Gymnetron pascuorum (Gyllenhall)
	Gynaetron nexum Germar
	Homocolabus analis (Illiger)
	Hypera compta Say
	Hypera postica (Gyllenhal)
	Hypera punctata (F.)
	Larinus planus (F.)
	Lechriops oculata (Say)
	Lignyodes fraxini (LeConte)
	Listronotus porcellus (Say)
	Listronotus sp. probably dorsalis
	Listronotus sparsus Say
	Magdalis inconspicuous Horn
	Magdalis pandura Say
	Magdalis salicis Horn
	Mecinus pyraster (Herbst)
	Notaris puncticollis (LeConte)
	Notiodes punctatus (LeConte)
	Odontocorynus salebrosus (Casey)
	Odontopus calceatus (Say)
	Otiorhynchus rugosostriatus (Goeze)
	Otiorhynchus sulcatus Fabricius
	Pelenomus sp.
	Perigaster liturata (Dietz)
	Phyllobius oblongus (L.)
	Phyxelis rigidus Say
	Pissodes affinis Randall
	Plocamus hispidulus LeConte
	Pseudanthonomus validus Dietz
	Pseudobaris nigrina (Say)
	Rhinoncus longulus (LeConte)
	Rhinoncus triangularis (Say)
	Rhynchaenus pallicornis (Say)
	Rhyssomatus lineaticollis (Say)
	Sciaphilus asperatus (Bonsdorff)
	Sibariops sp.
	Siberiops confusa (Boheman)
	Sitona cylindricollis (F.)
	Stethobaris spp.

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Curculionidae- Weevils or Snout Beetles	*Stenobaris ovata* (LeConte)
	Stenoscellis brevis (Boheman)
	Tachyerges niger (Horn)
	Tanyspherus lemnae (F.)
	Tychius picirostris (Fabricius)
	Tychius prob. stephensi Schoenheer
	Tychius stephensi Schoenherr
Dermestidae- Dermestid Beetles	*Trogoderma ornatum* (Say)
Derodontidae- Tooth Neck Fungus Beetles	*Derodontus esotericus* (Lawrence)
	Derodontus maculatus (Melsheimer)
Dryopidae- Long- Toed Water Beetles	*Helichus basalis* LeConte
Dytiscidae- Predaceous Diving Beetles	*Acilius fraternus* (Harris)
	Acilius mediatus (Say)
	Acilius semisulcatus Aube
	Acilius sylvanus Hilsenhoff
	Agabetes acuductus (Harris)
	Agabus ambiguus Say
	Agabus anthracinus Mannerheim
	Agabus gagates Aube
	Agabus punctatus Melsheimer
	Agabus semivittatus LeConte
	Bidessonotus inconspicuus (LeConte)
	Celina hubbelli Young
	Copelatus glyphicus (Say)
	Coptotomus lenticus Hilsenhoff
	Coptotomus venustus Say
	Cybister fimbriolatus (Say)
	Desmopachria convexa (Aube)
	Dytiscus verticalis Say
	Graphoderus liberus (Say)
	Heterostemuta ohionis (Fall)
	Heterosternuta wickhami (Zaitzev)
	Hydroporus dichrous Melsheimer
	Hydroporus melsheimeri Fall
	Hydroporus niger Say
	Hydroporus signatus Mannerheim
	Hydroporus striola Gyllenhal
	Hydroporus sp.
	Hydrovatus pustulatus pustulatus Melsheimer
	Hygrotus laccophilinus (LeConte)

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Dytiscidae- Predaceous Diving Beetles	*Hygrotus nubilus* (LeConte)
	Hygrotus picatus (Kirby)
	Hygrotus sayi Balfour-Browne
	Ilybius biguttulus (Germar)
	Ilybius oblitus Sharp
	Laccophilus fasciatus rufus Melsheimer
	Laccophilus maculosus maculosus Say
	Laccophilus undatus Aube
	Liodessus affinis (Say)
	Matus bicarinatus (Say)
	Matus ovatus ovatus Leech
	Neoporus clypealis (Sharp)
	Neoporus sp.
	Neoporus sulcipennis (Fall)
	Neoporus undulatus (Say)
	Rhantus binotatus (Harris)
	Thermonectus basillaris (Harris)
	Uvarus falli Young
	Uvarus suburbanus Fall
Elateridae- Click Beetles	*Aeolus mellilus* (Say)
	Agriotes arcanus Brown
	Agriotes oblongicollis (Melsheimer)
	Agriotes pubescens Melsheimer
	Agriotes quebecensis Brown
	Ampedus areolatus (Say)
	Ampedus linteus (Say)
	Ampedus melanotoides Brown
	Ampedus nigricollis (Herbst)
	Ampedus rubricus (Say)
	Ampedus sanguinipennis (Say)
	Ampedus semicintus (Randall)
	Athous acanthus (Say)
	Athous acanthus maculicollis LeConte
	Athous brightwelli (Kirby)
	Athous cucullatus (Say)
	Athous scapularis (Say)
	Ctenicera caricinus (Germar)
	Ctenicera cylindriformis (Herbst)
	Ctenicera hamata (Say)
	Ctenicera hieroglyphicus (Say)

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Elateridae- Click Beetles	*Ctenicera lobatus* (VanDyke)
	Ctenicera pyrrhos (Herbst)
	Ctenicera vemalis (Hentz)
	Dalopius spp.
	Dipropus soleatus (Say)
	Elater abruptus Say
	Glyphonyx inquinatus (Say)
	Hemicrepidius bilobatus (Say)
	Hemicrepidius memnonius (Herbst)
	Hemicrepidius sp.
	Lacon discoidea (Weber)
	Limonius basilaris (Say)
	Limonius confusus LeConte
	Limonius stigma (Herbst)
	Melanotus americanus (Herbst)
	Melanotus castanipes (Paykull)
	Melanotus hyslopi VanZwaluwenburg
	Melanotus morosus Candeze
	Melanotus sagittarius (LeConte)
	Melanotus similis (Kirby)
	Melanotus sp.
	Melanotus tralpezoideus (LeConte)
Elmidae- Rime Beetles	*Ancyronyx vareigata* (Gennar)
	Dubiraphia minima Hilsenhoff
	Dubiraphia quadrinotata (Say)
	Macronychus glabratus Say
	Optioservus fastiditus (LeConte)
	Optioservus ovalis (LeConte)
	Stenelmis crenata (Say)
Endomychidae- Handsome Fungus Beetles	*Aphorista vittata* (F.)
	Endomychus biguttatus (Say)
	Lycoperdina ferruginea LeConte
	Mycetina perpulchra (Newman)
	Phymaphora pulchella Newman
Erotylidae- Pleasing Fungus Beetles	*Triplax dissimulator* (Crotch)
	Tritoma mimetica (Crotch)
	Tritoma sanguinipennis (Say)
Eucnemidae- False Click Beetles	*Dirhagus triangularis* (Say)
	Dirhagus pectinatus (LeConte)
	Fornax orchesides (Newman)

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Eucnemidae- False Click Beetles	*Hylis terminalis* (LeConte)
	Isorhipis obliqua (Say)
	Isorhipis ruficornis (Say)
	Microrhagus trianugularis (Say)
	Stenelmis crenata (Say)
Geotrupidae- Earth-boring Dung Beetles	*Bolboceras filicornis* (Say)
	Geotrupes splendidus splendidus (Fabricius)
Gyrinidae- Whirligig Beetles	*Dinetus assimilis* Kirby
	Dinetus discolor Aube
	Dinetus emarginatus Say
	Dinetus nigrior Roberts
	Gyrinus gibber LeConte
	Gyrinus lecontei Fall
	Gyrinus maculiventris LeConte
	Gyrinus marginellus Fall
	Gyrinus sp.
Haliplidae- Crawling Water Beetle	*Haliplus borealis* LeConte
	Haliplus fasciatus Aube
	Haliplus immaculicollis Harris
	Haliplus leopardus Roberts
	Haliplus longulus LeConte
	Haliplus pantherinus Aube
	Haliplus triopsis Say
	Heterosternuta wickhami (Zaitzev)
	Peltodytes duodecimpunctatus (Say)
	Peltodytes edentulus (LeConte)
	Peltodytes lengi Roberts
	Peltodytes muticus (LeConte)
	Peltodytes sexmaculatus Roberts
	Peltodytes shermani (Roberts)
	Peltodytes tortulosus Roberts
Heterocerideae- Variegated Mud-Loving	*Heterocerus longulobulus* (Pacheco)
	Heterocerus mollinus Kiesenwetter
	Heterocerus spp.
	Hetercoerus tristis Mannerheim
	Tropicus pusillus (Say)
Histeridae- Hister Beetles	*Aeletes floridae* (Marseul)
	Cylistix gracilis (LeConte)
	Euspilotus assimilis (Paykull)
	Hister abbreviatus Fabricius

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Histeridae- Hister Beetles	*Hister foedatus* LeConte
	Holoepta aequalis (Say)
	Holoepta lucida LeConte
	Platylomalus aequalis (Say)
	Platysoma coarctatum LeConte
	Platlsoma lecontei Marseul
Hydrophilidae- Water Scavenger Beetles	*Anacaena limbata* (Fabricius)
	Anacaena suturalis (LeConte)
	Berosus fraternus (LeConte)
	Berosus pantherinus LeConte
	Berosus peregrinus (Herbst)
	Berosus striatus (Say)
	Cercyon assecla Smetana
	Crenitis digesta (LeConte)
	Cymbiodyta chamberlaini Smetana
	Cymbiodyta vindicata Fall
	Cymbiodyta sp.
	Enochrus cinctus (Say)
	Enochrus collinus (Brown)
	Enochrus consortus Green
	Enochrus hamiltoni (Horn)
	Enochrus homi Leech
	Enochrus ochraceus (Melsheimer)
	Enochrus perplexus (LeConte)
	Enochrus pygmaeus
	Enochrus sayi Gundersen
	Enochrus sp.
	Helochares maculicollis Mulsant
	Helocombus bifidus (LeConte)
	Helophorus lineatis LeConte
	Helophorus marginicollis Smetana
	Helophorus sp.
	Hydrobius fuscipes (Linnaeus)
	Helophorus melaenus (Germar)
	Hydrochara obtusata Say
	Hydrochara sp.
	Hydrochara soror Smetana
	Hydrochus neosquamifer Smetana
	Hydrochus rufipes (Melsheimer)
	Hydrochus scabratus Mulsant

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Hydrophilidae- Water Scavenger Beetles	*Hydrochus squamifer* (LeConte)
	Hydrochus subcupreus (Randall)
	Laccobius spangleri Cheary
	Paracymus sp.
	Paracymus subcupreus (Say)
	Phaenonotum existriatum (Say)
	Tropisternus blatcheyi d'Orchymont
	Tropisternus glaber (Herbst)
	Tropisternus lateralis nimbatus Say
	Tropisternus mixtus (LeConte)
	Tropisternus natator d'Orchymont
Lagriidae- Long Jointed Bark Beetles	*Statira gagatina* Melsheimer
Lampyridae- Fireflies or Lightningbugs	*Ellychnia corrusca* (L.)
	Lucidota atra (G.A. Oliver)
	Lucidota sp.
	Photinus carotinus Green
	Photinus consanguineus
	Photinus pyralis L.
	Photinus sp. Female
	Photuris sp.
	Pyropyga decipiens (Harris)
	Pyropyga sp.
Laemophlocidae- Flat Bark Beetles	*Laemophloeus fasciatus* (Melsheimer)
Languridae- Lizard Beetles	*Toramus* sp.
Lathriidae- Minute Brown Scavenger Beetles	*Corticaria sp.*
	Corticarina longipennis (LeConte)
	Enicmus aterrimus (Motschulsky)
	Melanophtalma americana (Mannerheim)
Leptodiridae- Small Carrion Beetles	*Catops* sp.
	Nemadus or Dissochaetus sp.
	Prionochaeta opaca (Say)
Lucanidae- Stag Beetles	*Ceruchus piceus* (Weber)
	Platycerus piceus Kirby
	Platycerus virescens (Fabricius}
Lycidae- Net-winged Beetles	*Calopteron reticulatum* (F.)
	Celetes basalis LeConte
Melandryidae- False Darkling Beetles	*Canifa* sp.
	Dircaea liturata (LeConte)
	Eustrophopsis bicolor (F.)
	Eustrophus tomentosus Say

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Melandryidae- False Darkling Beetles	*Hallomenus* sp.
	Hypulus simulator Newman
	Melandrya striata Say
	Symphora rugosa (Haldeman)
	Symphora sp.
	Synchroa punctata Newman
Meloidae- Blister Beetles	*Epicauta cinera* (Forster)
	Epicauta pensylvanica (DeGeer)
	Meloe americanus (Leach)
	Meloe augusticollis Say
	Nemognatha nemorensis (Hentz)
Melyridae- Soft Winged Flower Beetles	*Collops quadrimaculatus* (F.)
Monotomidae- Rhizophagid Beetles	*Pycnotomina cavicolle* (Horn)
Mordellidae- Tumbling Flower Beetles	*Mordella marginata* Melsheimer
	Mordellistena aspersa (Melsheimer)
	Mordellistena bihamata (Melsheimer)
	Mordella marginata Melsheimer
	Mordellistena bihamata Melsheimer
	Mordellistena pubescens (F.)
	Mordellistena scapularis (Say)
	Mordellistena trifasciata (Say)
	Tomoxia serval (Say)
Mycetophagidae- Hairy Fungus Beetles	*Litargus* sp.
	Litargus balteatus LeConte
	Litargus tetraspilotus LeConte
	Mycetophagus melsheimeri LeConte
Nitidulidae- Sap Beetles	*Amphicrossus ciliatus* (Olivier)
	Carophilus ampla
	Carpophilus antiquus (Melsheimer)
	Carpophilus brachypterus (Say)
	Carpophilus corticinus Erichson
	Carpophilus freemani Dobson
	Carpophilus hemipterus (L.)
	Carpophilus lugubris Murray
	Carpophilus marginatus Erichson
	Carpophilus marginellus Motschulsky
	Carpophilus sayi Parsons
	Colopterus niger (Say)
	Colopterus semitectus (Say)
	Colopterus spp.

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Nitidulidae- Sap Beetles	*Conotelus obscurus* Erichson
	Cryptarcha ampla Erichson
	Cryptarcha concinna Melsheimer
	Cryptarcha strigatula Parsons
	Epuraea peltoides Horn
	Epuraea rufa (Say)
	Epuraea spp.
	Glischrochilus confluentus (Say)
	Glischrochilus fasciatus (Olivier)
	Glischrochilus quadrisignatus (Say)
	Glischrochilus sanguinolentus (Olivier)
	Glischrochilus siepmanni Brown
	Lobiopa undulata (Say)
	Meligethes spp.
	Omosita colon (L.)
	Pallodes pallidus (Beauvois)
	Phenolia grossa (F.)
	Prometopia sexmaculata (Say)
	Stelidota geminata (Say)
	Stelidota octomaculata (Say)
Noteridae- Burrowing Water Beetles	*Hydrocanthus iricolor* Say
	Suphisellus puncticollis Crotch
Oedemeridae- False Blister Beetles	*Asclera ruficollis* (Say)
Passandridae- Flat Bark Beetles	*Catogenus rufus* (F.)
Pedilidae- False Antlike Flower Beetles	*Pedilus* sp.
Phalacridae- Shining Mold Beetles	*Acylomus ergoti* (Casey)
	Olibrus sp.
	Phlalcrus politus (Melsheimer)
Phengodidae- Glowworms	*Phengodes fusciceps* LeConte
Psephenidae- Water Penny Beetles	*Extopria* sp.
	Ectopria nervosa Melsheimer
Ptilodactylidae- Toad-Winged Beetles	*Ptilodactyla serricollis* (Say)
Pyrochroidae- Fire Colored Beetles	*Dendroides canadensis* (Latreille)
	Dendroides concolor (Newman)
Pyrochroidae- Fire Colored Beetles	*Neopyrochroa flabellata* (F.)
	Pedilus elegans (Hentz)
Rhizophagidae- Rhizophagid Beetles	*Bactridium* sp.
	Pycnotomina cavicolle (Horn)
	Rhizophagaus sp.
Salpingidae- Narrow Waisted Bark Beetles	*Rhinosimus viridiaenus* Randall

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Scarabaeidae- Scarabs, Mayor June Beetles	*Aphodius bicolor* Say
	Aphodius fimetarius (L.)
	Aphodius granarius (L.)
	Aphodius leopardus Horn
	Aphodius lutulentus Haldeman
	Aphodius manitobensis Brown
	Aphodius rufipes (L.)
	Aphodius rusicola Melsheimer
	Ataenius strigatus (Say)
	Copris fricator fricator (Fabricius)
	Cyclocephala borealis Arrow
	Dialytes truncatus Melsheimer
	Dialytes ulkei Horn
	Dichelonyx diluta (Fall)
	Dichelonyx elongatula (F.)
	Gnorimella maculosa (Knoch)
	Hoplia trifasciata Say
	Ligyrus relictus (Say)
	Macrodactylus subspinosus (F.)
	Maladera castanea (Arrow)
	Onthophagus hecate hecate (Panzer)
	Onthophagus striatulus striatulus (Beauvois)
	Osmoderma scabra (Beauvois)
	Phyllophaga anxia
	Phyllophaga balia (Say)
	Phyloophaga hirsuta (Knoch)
	Phyllophaga knochii (Schoenherr & Gyllenhal)
	Popilla japonica Newnman
	Serica atricapilla (Kirby)
	Serica intermixta Blatchley
	Serica serica (Illiger)
	Serica verpertina (Gyllenhal)
	Tomarus relictus (Say)
	Valgus canaliculatus (F.)
Scirtidae/Heloidae- Marsh Beetles	*Cyphon nebulosus* (LeConte)
	Cyphon neovaribilis Klausnitzer
	Prionocyphon discoideus (Say)
	Prionocyphon limbatus LeConte
Scolytidae- Bark and Ambrosia Beetles	*Chramesus hicoriae* LeConte
	Corthylus columbianus Hopkins

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Scolytidae- Bark and Ambrosia Beetles	*Corthylus* sp.
	Dryocoetes autographus (Ratzeburg)
	Euwallacea validus (Eichoft)
	Gnathotrichus materiarius (Fitch)
	Hylastes opacus Erichson
	Hylastinus obscurus (Marsham)
	Hylurgopinus rufipes (Eichoff)
	Ips pini (Say)
	Lymantor decipiens (LeConte)
	Monarthrum fasciatum (Say)
	Monarthrum mali (Fitch)
	Orthotomicus caelatus (Eichhoft)
	Phloeotribus liminarus (Harris)
	Pityogenes hopkinsi Swaine
	Pityophthorus cariniceps LeConte
	Pityophthorus sp.
	Pseudopityophthorus spp.
	Scolytus mali (Bechstein)
	Scolytus multistriatus (Marsham)
	Xyleborinus saxeseni (Ratzeburg)
	Xyleborus atratus Eichoff
	Xyleborus ferrugineus (F.)
	Xyleborus obesus LeConte
	Xyleborus sayi (Hopkins)
	Xyleborus xylographus (Say)
	Xyleoterinus politus (Say)
	Xylosandrus germanus (Blandford)
	Xyloterinus politus (Say)
Scraptiidae	*Anaspis rufa* Say
	Canifa sp.
Silphidae- Carrion Beetles	*Necrodes surinamensis* (Fabricius)
	Necrophila americana (Linnaeus)
	Nicrophorus orbicollis Say
	Nicrophorus sayi Laporte
	Nicrophorus tomentosus Weber
	Oiceoptoma inaequale (Fabricius)
	Oiceoptoma noveboracense (Forster)
Silvanidae- Flat Bark Beetles	*Cathartosilvanus imbellis* (LeConte)
	Uleiota dubius (F.)
Sphindidae- Dry Fungus Beetles	*Sphindidus* sp.

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Staphylinidae- Rove Beetles	*Aleochara* sp.
	Aleocharinae sp. 1
	Aleocharinae sp. 2
	Aleocharinae sp. 3
	Aleocharinae sp. 4
	Belonuchus formosus (Gravenhorst)
	Bisnius blandus (Gravenhorst)
	Carphacis intrusus (Horn)
	Creophilus maxillosus (L.)
	Erichsonius brachycephalus Frank
	Erichsonius cinerascens (Gravenhorst)
	Gabrius sp.
	Hesperus apicialis (Say)
	Homaeotarsus sp.
	Laetulonthus laetulus (Say)
	Lathrobium sp.
	Neohypnus sp.
	Onthloestes cingulatus (Gravenhorst)
	Oxyporus quinquemaculatus LeConte
	Philonthus politus (L.)
	Philonthus sp. 3
	Platydracus violaceus (Gravenhorst)
	Quedius fulgidus (F.)
	Quedius plagiatus (Laevigatus)
	Quedius plagiatus laevigatus (Gyllenhal)
	Sepedophilus versicolor (Casey)
	Siagonium punctatum LeConte
	Tachinus flmbriatus Gravenhorst
	Tachinus fumipennis (Say)
	Tachinus luridus Erichson
	Xestolinus abdominalus Casey
Stenotrachelidae, formerly Cephaloidae- False Long-Horned Beetles	*Cephaloon lepturides* Newman
Tenebrionidae- Darkling Beetles	*Alleculinae* sp.
	Alobates pennsylvanica (DeGeer)
	Anaedus aenus (Ziegler)
	Anaedus brunneus (Ziegler)
	Bolitotherus corotus (Panzer)
	Capnochroa fulginosa (Melsheimer)
	Corticeus praetermissus (Fall)
	Corticeus tenuis (LeConte)

CAMP RAVENNA – ORDER COLEOPTERA (BEETLES)	
Family	**Taxon**
Tenebrionidae- Darkling Beetles	*Diaperis maculata* (Olivier)
	Isomira sericea (Say)
	Meracantha contracta (Beauvois)
	Mycetochara haldeman (LeConte)
	Neatus tenebrioides (Beauvois)
	Neomida bicornis (Fabricius)
	Paratenetus punctatus (Spinola)
	Platydema excavatum (Say)
	Platydema subcostatum Laporte and Brulle
	Uloma impressa Melsheimer
Tetratomidae, formerly part of Melandryidae	*Penthe obliquata* (F.)
Throsicidae- Throscid Beetles	*Aulonothroscus* sp.
	Trixagus chevrolati (Bonvouloir)
	Trixagus sp.
Trogidae- Hide Beetles	Trox aequalis Say
	Trox capillaris Say
	Trox hamatus Robinson
	Trox unistriatus Beauvois
	Trox variolatus Melsheimer
Trogossitidae- Bark Gnawing Beetles	*Grynocharis quadrilineata* Melsheimer
	Ostomida sp.
	Tenebroides corticalis Melsheimer
	Tenebroides nanum Melsheimer
	Thymalus marginicollis Chevrolat

CAMP RAVENNA – ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	**Hodge No.* / Taxon**	**State Status**
APATELODIDAE - Apatelodid Moths	*07663 Apatelodes torrefacta*	-
	07665 Olceclostera angelica	-
APATURIDAE - Leaf Winged Butterflies	*04557 Asterocampa celtis celtis*	-
ARCTIIDAE -Tiger, Lichen and Wasp Moths	*08045.1 Crambidia pallida*	-
	08098 Clemensia albata	-
	08107 Haploa clymene	-
	08109 Haploa reversa	-
	08111 Haploa lecontei	-
	08112 Haploa confusa	-
	08118 Holomelina opella	-
	08121 Holomelina aurantiaca	-
	08129 Pyrrharctia isabella	-

CAMP RAVENNA – ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	**Hodge No.* / Taxon**	**State Status**
ARCTIIDAE -Tiger, Lichen and Wasp Moths	*08131 Estigmene acrea*	-
	08133 Spilosoma latipennis	-
	08134 Spilosoma congrua	-
	08137 Spilosoma virginica	-
	08140 Hyphantria cunea	-
	08146 Ecpantheria scribonia	-
	08156a Phragmatobia fuliginosa rubricosa	-
	08169 Apantesis phalerata	-
	08171 Apantesis nais	-
	08188 Grammia figurata	-
	08196 Grammia parthenice	-
	08197 Grammia virgo	-
	08199 Grammia arge	-
	08203 Halysidota tesselaris	-
	08211 Lophocampa caryae	-
	08214 Lophocampa maculata	-
	08230 Cycnia tenera	-
	08231 Cycnia oregonensis	-
	08238 Euchaetes egle	-
	08262 Ctenucha virginica	-
	08267 Cisseps fulvicollis	-
COSSIDAE- Carpenterworm and Leopard Moths	*02694 Prionoxystus macmurtrei*	-
DANAIDAE - Milkweed Butterflies	*04614 Danaus plexippus plexippus*	-
DREPANIDAE - Hooktip Moths	*06251 Drepana arcuata*	-
	06255 Oreta rosea	-
EPIPLEMIDAE - Epiplemid Moths	*07653 Cailedapteryx dryopterata*	-
GEOMETRIDAE - Inchworm Moths	*06258 Alsophila pometara*	-
	06261 Heliomata cycladata	-
	06273 Itame pustularia	-
	06299 Itame coortaria	-
	06303 Itame subcessaria	-
	06326 Semiothisa aemulataria	-
	06331 Semiothisa promiscuata	-
	06342 Semiothisa bisignata	-
	06348 Semiothisa fissinotata	-
	06449 Glena cribrataria	-
	06584 Anacamptodes humaria	-
	06586 Anacamptodes defectaria	-
	06588 Iridopsis larvaria	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
GEOMETRIDAE - Inchworm Moths	*06590 Anavitrinelia pampinaria*	-
	06594 Cleora sublunaria	-
	06597 Ectropis crepuscularia	-
	06598 Protoboarmia porcelaria	-
	06599 Epimecis hortaria	-
	06620 Melanolophia canadaria	-
	06621 Melanolophia signataria	-
	06640a Biston betularia cognataria	-
	06654 Hypagyrtis unipunctata	-
	06655 Hypagyrtis ester	-
	06656 Hypagyrtis piniata	-
	06658 Phigalia titea	-
	06659 Phigalia denticulate	-
	06660 Phigalia strigataria	-
	06662 Paleacrita vernata	-
	06663 Paleacrita merricata	-
	06665 Erannis tiliaria	-
	06666 Lomographa semiclarata	-
	06667 Lomographa vestaliata	-
	06668 Lomographa glomeraria	-
	06677 Cabera erythemaria	-
	06720 Lylrosis unitaria	-
	06724 Euchlaena serrata	-
	06725 Euchlaena effecta	-
	06726 Euchlaena obtusaria	-
	06729 Euchlaena johnsonaria	-
	06734 Euchlaena marginaria	-
	06737 Euchlaena tigrinaria	-
	06739 Euchlaena irraria	-
	06740 Xanthotype urticaria	-
	06753 Pero honestaria	-
	06754 Pero hubneraria	-
	06755 Pero Morrisornaria	-
	06763 Nacophora quernaria	-
	06796 Campaea periata	-
	06797 Ennomos magnaria	-
	06798 Ennomos subsignaria	-
	06804 Petrophora subaequaria	-
	06819 Metanema inatomaria	-
	06820 Metenema determinata	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
GEOMETRIDAE - Inchworm Moths	*06822 Metarranthis duaria*	-
	06826 Metananthis hypochraria	-
	06834 Cepphis decoloraria	-
	06835 Cepphis armataria	-
	06836 Anagoga occiduaria	-
	06837 Probole alienaria	-
	06838 Probole amicaria	-
	06840 Plagodis serinaria	-
	06841 Plagodis kuetzingi	-
	06842 Plagodis phlogosaria	-
	06843 Plagodis fervidaria	-
	06844 Plagodis alcoolaria	-
	06884 Besma endropiaria	-
	06885 Besma quercivoraria	-
	06888 Lambdina fiscellaria	-
	06892 Lambdina pellucidaria	-
	06894a Lambdina fervidara athasaria	-
	06906 Nepytia canosaria	-
	06912 Sicya macularia	-
	06941 Eusarca confusaria	-
	06963 Tetracis crocallata	-
	06964 Tetracis cachexiata 06965 Eugonobapta nivosaria	--
	06966 Eutrapela clementaria	-
	06982 Prochoerodes transversata	-
	06987 Antepione thisoaria	-
	07009 Nematocampa limbata	-
	07046 Nemoria bistriaria	-
	07048 Nemoria mimosaria	-
	07053 Dichorda iridaria	-
	07058 Synchlora aerata	-
	07084 Hethemia pistasciaria	-
	07132 Pleuroprucha insulsaria	-
	07136 Cyclophora packardi	-
	07139 Cyclophora pendulinaria	-
	07146 Haematopis grataria	-
	07159 Scopula limboundata	-
	07169 Scopula inductata	-
	07189 Dysstroma hersiliata	-
	07196 Eulithis diversilineata	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	**Hodge No.* / Taxon**	**State Status**
EOMETRIDAE - Inchworm Moths	*07197 Eulithis gracilineata*	-
	07201 Eulithis testata	-
	07290 Coryphista meadii	-
	07292 Hydria prunivorata	-
	07307 Mesoleuca ruficillata	-
	07329 Anticlea vasiliata	-
	07336 Anticlea multiferata	-
	07368 Xanthorhoe labradorensis	-
	07388 Xanthorhoe ferrugata	-
	07390 Xanthorhoe lacustrata	-
	07394 Epirrhoe alternata	-
	07399a Euphyia unangulata intermediata	-
	07414 Orthonama obstipata	-
	07416 Costaconvexa centrostrigaria	-
	07422 Hydrelia inornatana	-
	07423 Hydrelia albifera	-
	07430 Trichodezia albovittata	-
	07440 Eubaphe mendica	-
	07445 Horisme intestinata	-
	07459 Eupithecia columbiata	-
	07474 Eupithecia miserulata	-
	07536 Eupithecia swettii	-
	07543 Eupithecia annulata	-
	07605 Eupithecia ravocostallata	-
	07640 Lobophora nivigerata	-
	07647 Hererophleps triguttaria	-
	07648 Dyspteris abortivaria	-
HEPIALIDAE - Ghost Moths or Swifts	*00018 Sthenopis rgenteomaculata*	-
HESPERIIDAE – Skippers	*03870 Epargyreus clarus*	-
	03904 Achalurus lyciades	-
	03945 Erynnis icelus	-
	03947 Erynnis juvenalis	-
	03952 Erynnis horatius	-
	03959 Erynnis baptisiae	-
	03977 Pholisura catullus	-
	04004 Ancyloxpha numitor	-
	04012 Thymelicus lineola	-
	04013 Hylephila phyleus phyleus	-
	04023 Hesperia leoardus leonardus	-

CAMP RAVENNA – ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	**Hodge No.* / Taxon**	**State Status**
HESPERIIDAE - Skippers	*04033 Hespenia sassacus sassacus*	-
	04036 Polites coras	-
	04041 Polites themistocles	-
	04042 Polites origenes orgines	-
	04043 Polites mystic mystic	-
	04047 Wallengrenia egeremet	-
	04048 Pompeius verna	-
	04051 Atrytone logan logan	-
	04059 Poanes hobomok hobomk	-
	04060 Poanes zabulon zabulon	-
	04075 Euphyes conspicua conspicua	-
	04078 Euphyes vestris metacomet	-
LASIOCAMPIDAE - Tent Caterpillar and Lappet Moths	*07670 Tolype velleda*	-
	07673 Tolype laricis	-
	07685 Heteropacha rileyana	-
	07687 Phyllodesma americana	-
	07698 Malacosoma disstria	-
	07701 Malacosoma americanum	-
LIMACODIDAE -Slug Caterpillar Moths	*04652 Tortricidia testacea*	-
	04654 Tortricidia flexuosa	-
	04659 Packardia geminata	-
	04661 Packardia elegans	-
	04665 Lithacodes fasciola	-
	04667 Apoda y-inversum	-
	04669 Apoda biguttata	-
	04671 Prolimacodes badia	-
	04681 Isa textula	-
	04685 Adoneta spinuloides	-
	04697 Euclea delphinii	-
	04698 Parasa chloris	
LYCAENIDAE - Gossamer Winged Butterflies	*04251 Lycaena phlaes americana*	-
	04256 Lycaena hyllus	-
	04275 Harkenclenus titus titus	-
	04278 Satyrium acadica acadica	-
	04282a Satyrium calanus falicer	-
	04283 Satyrium caryaevorum	-
	04285 Satyrium liparops strigosum	-
	04336a Strymon melinus humuli	-
	04361 Everes comyntas comyntas	-
	04363 Celastrina ladon	-

CAMP RAVENNA – ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	**Hodge No.* / Taxon**	**State Status**
LYMANTRIDAE - Tussock Moths	*08296 Dasychira basiflava*	-
	08302 Dasychira obliquata	-
	08314 Orgyia definita	-
	08316 Orgyia leucostigma	-
	08318 Lymantria dispar	-
MIMALLONIDAE - Sack-bearing Moths	*07659 Lacosoma chiridota*	-
	07662 Cicinnus melsheimeri	-
NOCTUIDAE -Owlet or Noctuid Moths	*08322 Idia americalis*	-
	08323 Idia aemula	-
	08326 Idia rotundalis	-
	08327 Idia forbesi	-
	08329 Idia diminuendis	-
	08334 Idia lubricalis	-
	08338 Phalaenophana pyramusalis	-
	08340 Zanclognatha lituralis	-
	08345 Zanclognatha laevigata	-
	08348 Zanclognatha pedipilalis	-
	08350 Zanclognatha martha	-
	08351 Zanclognatha cruralis	-
	08352 Zanclognatha jacchusalis	-
	08353 Zanclognatha ochreipennis	-
	08355 Chytolita morbidalis	-
	08356 Chytolita petrealis	-
	08357 Macrochilo absorotalis	-
	08364 Phalaenostola larentloides	-
	08370 Bleptina caradrinalis	-
	08379 Renia factiosalis	-
	08380 Renia nemoralis	-
	08381 Renia discoloralis	-
	08386 Renia adspergillus	-
	08393 Lascoria ambigualis	-
	08397 Palthis angulalis	-
	08398 Palthis asopialis	-
	08401 Redectis vitrea	-
	08404 Rivula propinqualis	-
	08411 Colobochyla interpuncta	-
	08412 Melanomma aurcinctaria	-
	08427 Dyspyralis puncticosta	-
	08428 Dyspyralios nigella	-
	08441 Bomolocha manalis	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
NOCTUIDAE -Owlet or Noctuid Moths	*08442 Bomolocha baltimoralis*	-
	08443 Bomolocha bijugalis	-
	08444 Bomolocha palparia	-
	08445 Bomolocha abalienalis	-
	08446 Bomolocha deceptalis	-
	08447 Bomolocha madefactalis	-
	08465 Plathypena scabra	-
	08479 Spargaloma sexpunctata	-
	08481 Phytometra rhodarialis	-
	08490 Pangrapta decoralis	-
	08491 Ledaea perditalis	-
	08493 Isogona tenuis	-
	08499 Metalectra discalis	-
	08514 Scolecocampa liburna	-
	08536 Calyptra canadensis	-
	08555 Scoliopteryx libatrix	-
	08574 Anticarsia gemmatalis	-
	08587 Panopoda rufimargo	-
	08588 Panopoda carneicosta	-
	08591 Phoberia atomaris	-
	08592 Cissusa spadix	-
	08649 Ascalapha odorata	-
	08651 Lesmone detrahens	-
	08689 Zale lunata	-
	08692 Zale galbanata	-
	08695 Zale undularis	-
	08697 Zale minerea	-
	08700 Zale squamularis	-
	08703 Zale duplicata	-
	08705 Zale bethunei	-
	08713 Zale lunifera	-
	08716 Zale unilineata	-
	08717 Zale horrida	-
	08719 Eupathenos nubilis	-
	08721 Allotria elonympha	-
	08727 Parallelia bistriaris	-
	08738 Caenurgina crassiuscula	-
	08739 Caenurgina erechtea	-
	08764 Argyrostrotis anilis	-
	08771 Catocala piatrix	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
NOCTUIDAE - Owlet or Noctuid Moths	*08773 Catocala epione*	-
	08778 Catocala habilis	-
	08779 Catocala serena	-
	08781 Catocala judith	-
	08782 Catocala flebilis	-
	08783 Catocala angusii	-
	08784 Catocala obscura	-
	08785 Catocala residua	-
	08788 Catocala retecta	-
	08792 Catocala vidua	-
	08795 Catocala palaeogama	-
	08796 Catocala nebulosa	-
	08797 Catocala subnata	-
	08798 Catocaia neogama	-
	08801 Catocala ilia	-
	08802 Catocala cerogama	-
	08803 Catocala relicta	-
	08805 Catocala unijuga	-
	08806 Catocala parta	-
	08832 Catocala cara	-
	08833 Catocala concumbens	-
	08834 Catocala amatrix	-
	08846 Catocala sordida	-
	08847 Catocala gracilis	E
	08851 Catocala coccinata	-
	08857 Catocala ultronia	-
	08858 Catocala crataegi	-
	08863 Catocala mira	-
	08864 Catocala grynea	-
	08865 Catocala piraeclara	-
	08867 Catocaia blandula	-
	08876 Catocala micronympha	-
	08877 Catocaia connubialis	-
	08878 Catacola amica	-
	08881 Abrostola urentis	-
	08887 Trichoplusia ni	-
	08889 Ctenoplusia oxygramma	-
	08890 Pseudoplusia includens	-
	08898 Allagrapha aerea	-
	08904 Chrysanympha formosa	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
NOCTUIDAE - Owlet or Noctuid Moths	*08905 Eosphoropteryx thyatyroides*	-
	08908 Autographa precationis	-
	08924 Anagrapha falcifera	-
	08939 Syngrapha abstrusa	-
	08952 Plusia contexta	-
	08955 Marathyssa inficita	-
	08956 Marathyssa basalis	-
	08957 Paectes oculatrix	-
	08968 Eutelia pulcherrima	-
	08969 Baileya doubledayi	-
	08970 Baileya ophthalmica	-
	08971 Baileya dormitans	-
	08972 Baileya levitans	-
	08973 Baileya australis	-
	08983.1 Meganola phylla	-
	09044 Thioptera nigrofimbria	-
	09047 Lithacodia muscosula	-
	09048 Lithacodia albidula	-
	09053 Pseudostrotia cameola	-
	09055.1 Maliattha synochitis	-
	09055.3 Anterastria teratophora	-
	09056 Homophoberia cristata	-
	09057 Homophoberia apicosa	-
	09062 Cerma cerintha	-
	09065 Leuconycta diphteroides	-
	09070 Amyno octo	-
	09095 Tarachidia erastrioides	-
	09184 Colocasia flavicornis	-
	09185 Colocasia propinqualis	-
	09189 Charadra deridens	-
	09193 Raphia frater	-
	09199 Acronicta rubricoma	-
	09200 Acronicta americana	-
	09203 Acronicta dactylina	-
	09205 Acronicta lepusculina	-
	09209 Acronicta radcliffei	-
	09219 Acronicta connecta	-
	09221 Acronicta funeralis	-
	09225 Acronicta vinnula	-
	09227 Acronicta laetifica	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
NOCTUIDAE - Owlet or Noctuid Moths	*09229 Acronicta hasta*	-
	09235 Acronicta spinigera	-
	09236 Acronicta morula	-
	09237 Acronicta interrupta	-
	09238 Acronicta lobeliae	-
	09241 Acronicta fragilis	-
	09243 Acronicta ovata	-
	09244 Acronicta modica	-
	09245 Acronicta haesitata	-
	09247 Acronicta tristis	-
	09249 Acronicta increta	-
	09250 Acronicta inclara	-
	09254 Acronicta afflicta	-
	09257 Acronicta impleta	-
	09258 Acronicta sperata	-
	09259 Acronicta noctivaga	-
	09261 Acronicta impressa	-
	09264 Acronicta longa	-
	09266 Acronicta lithospila	-
	09272 AcronIcta oblinita	-
	09280 Simyra henrici	-
	09281 Agriopodes fallax	-
	09285 Polygrammate hebraeicum	-
	09286 Harrisimemna trisignata	-
	09299 Eudryas unio	-
	09301 Eudryas grata	-
	09328 Apamea nigrior	-
	09329 Apamea cariosa	-
	09341 Apamea vultuosa	-
	09348 Apamea amputatrix	-
	09361 Apamea mixta	SC
	09362 Apamea remissa indocilis	-
	09364 Apamea sordens	-
	09367 Apamea dubitans	-
	09272 Apamea helva	-
	9385.2 Apamea ophiogramma	-
	09391 Luperina passer	-
	09398 Eremobina jocasta	-
	09404 Oligia modica	-
	09406 Oligia fractilinea	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
NOCTUIDAE - Owlet or Noctuid Moths	*09408 Oligia exhausta*	-
	09410 Oligia crytora	-
	09415 Oligia bridghami	-
	09419 Olgia mactata	-
	09427 Meropleon diversicolor	-
	09429 Lemmeria digitalis	-
	09433 Xylomoia chagnoni	-
	09449 Archanara oblonga	-
	09450 Capsula subflava	*SI*
	09453 Celaena reniformis	-
	09454 Amphipoea velata	-
	09456 Amphipoea interoceanica	-
	09457 Amphipoea americana	-
	09466 Papaipema cataphracta	-
	09471 Papaipema arctivorens	-
	09473 Papaipema impecuniosa	-
	09479 Papaipema lysamachiae	-
	09483 Papaipema inquaesita	-
	09484 Papaipema rutila	-
	09485 Papaipema baptisiae	-
	09486 Papaipema birdi	-
	09495 Papaipema furcata	-
	09505 Papaipema cerrusata	-
	09509 Papaipema unimoda	-
	09516 Hydraecia stramentosa	-
	09520 Achatodes zeae	-
	09522 Iodopepla u-album	-
	09523 Bellura gortynoides	-
	09525 Bellura obliqua	-
	09545 Euplexia benesimillis	-
	09546 Phlogophora iris	-
	09547 Phlogophora periculosa	-
	09549 Enargia decolor	-
	09550 Enargia infumata	-
	09555 Ipomorpha pleonectusa	-
	09556 Chytonix palliatricula	-
	09578 Hyppa xylinoides	-
	09582 Nedra ramosula	-
	09626 Trachea delicata	-
	09631 Lithophane grotei	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
NOCTUIDAE - Owlet or Noctuid Moths	*09633 Callopistria cordata*	-
	09637 Magusa orbifera	-
	09638 Amphipyra pyramidoides	-
	09639 Amphipyra tragopoginis	-
	09647 Athetis miranda	-
	09650 Anorthodes tarda	-
	09661 Crambodes talidiformis	-
	09662 Balsa malana	-
	09663 Balsa tristrigella	-
	09664 Balsa labecula	-
	09665 Spodoptera exigua	-
	09666 Spodoptera frugiperda	-
	09669 Spodoptera ornithogalli	-
	09678 Elaphria versicolor	-
	09681 Elaphria festivoides	-
	09684 Elaphria grata	-
	09688 Galgula partita	-
	09689 Perigea xanthioides	-
	09690 Condica videns	-
	09696 Condica vecors	-
	09720 Ogdoconta cinereola	-
	09725 Stiriodes obtusa	-
	09766 Cirrhophanus triangulifer	-
	09815 Cosmia calami	-
	09818 Amolita fessa	-
	09878 Lithomola germana	-
	09886 Lithophane patefacta	-
	09887 Lithophane bethunei	-
	09888 Lithophane innominata	-
	09892 Lithophane disposita	-
	09893 Lithophane hemina	-
	09894 Lithophane oriunda	-
	09895 LIthophane signosa	-
	09910 Lithophane antennata	-
	09915 Lithophane grotei	-
	09916 Lithophane unimoda	-
	09922 Lithophane pexata	-
	09929 Pyreferra hesperidago	-
	09930 Pyreferra citromba	-
	09932 Pyreferra pettiti	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
NOCTUIDAE - Owlet or Noctuid Moths	*09933 Eupsilia vinulenta*	-
	09933.1 Eupsilia sidus	-
	09935 Eupsilia tristigmata	-
	09936 Eupsilia morrisoni	-
	09939 Eupsilia devia	-
	09943 Metaxaglea inulta	-
	09944 Metaxaglaea viatica	-
	09946 Epiglaea decliva	-
	09950 Chaetaglaea sericea	-
	09952 Eucirroedia pampina	-
	09957 Sunira bicolorago	-
	09961 Anathix ralla	-
	09965 Xanthia undescribed species	-
	09989 Sutyna privata	-
	09998 Brachylomia algens	SC
	10012 Psaphida electilis	-
	10013 Psaphida grandis	-
	10021 Copivaleria grotei	-
	10033 Catabena lineolata	-
	10065 Homohadena infixa	-
	10099 Oncocnemis saundersiana	-
	10200 Cucullia asteroides	-
	10202 Cucullia convexipennis	-
	10276 Polia imbrifera	-
	10288 Polia detracta	-
	10292 Melanchra adjuncta	-
	10293 Melanchra picta	-
	10299 Lacanobia subjuncta	-
	10300 Spiramater grandis	-
	10301 Spiramater lutra	-
	10304 Trichordestra legitima	-
	10368 Lacinipolia meditata	-
	10393 Lacinipolia teligera	-
	10397 Lacinipolia renigera	-
	10405 Lacinipolia lorea	-
	10431 Faronta diffusa	-
	10436 Aletia oxygala	-
	10438 Pseudaletia unipuncta	-
	10440 Leucania linita	-
	10444 Leucania phragmatidicola	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
NOCTUIDAE - Owlet or Noctuid Moths	*10445 Leucania linda*	-
	10446 Leucania multilinea	-
	10446.1 Leucania lapidaria	-
	10447 Leucania commoides	-
	10459 Leucania inermis	-
	10461 Leucania ursula	-
	10462 Leucania pseudargyria	-
	10487 Orthosia rubescens	-
	10488 Orthosia garmani	-
	10490 Orthosia revicta	-
	10495 Orthosia hibisci	-
	10501 Crocigrapha normani	-
	10502 Himella intractata	-
	10513 Egira dolosa	-
	10518 Achatia distincta	-
	10520 Morrisonia evicta	-
	10521 Morrisonia confusa	-
	10521.1 Morrisonia latex	-
	10524 Nephelodes minians	-
	10532 Homorthodes furfurata	*SC*
	10532b Homorthodes furfurata lindseyi	-
	10578 Pseudorthodes vecors	-
	10585 Orthodes crenulata	-
	10587 Orthodes cynica	-
	10589.1 Orthodes goodelli	-
	10627 Tricholita signata	-
	10648 Agrotis gladiaria	-
	10651 Agrotis venerabilis	-
	10663 Agrotis ipsilon	-
	10670 Feltia jaculifera	-
	10674 Feltia subgothica	-
	10675 Feltia tricosa	-
	10676 Feltia herilis	-
	10698.2 Trichosilia geniculata	-
	10803 Euxoa velleripennis	-
	10812 Euxoa bostoniensis)	-
	10851 Euxoa redimicula	-
	10891 Ochropleura plecta	-
	10903 Euagrotis illapsa	-
	10911 Anicla infecta	-

CAMP RAVENNA – ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	**Hodge No.* / Taxon**	**State Status**
NOCTUIDAE - Owlet or Noctuid Moths	*10915 Peridroma saucia*	-
	10925.1 Noctua pronuba	-
	10926 Spaelotis clandestina	-
	10942.1 Xestia dolosa	-
	10942a Xestia c-nigrum adela	-
	10943 Xestia normaniana	-
	10944 Xestia smithii	-
	10950 Xestia bicarnea	-
	10951 Xestia tenuicula	-
	10954 Xestia bugrai	-
	10955 Xestia badinodis	-
	10994 Cerastis tenebrifera	-
	10996 Metalepsis salicarum	-
	11006 Protolampra bruneicollis	-
	11007 Eueretagrotis sigmoides	-
	11008 Eueretagrotis perattenta	-
	11010 Heptagrotis phyllophora	-
	11029 Abagrotis alternata	-
	11043 Rhynchagrotis cupida	-
	11045 Rhynchagrotis anchocelioides	-
	11063 Pyrrhia undescribed species near umbra	-
	11068 Helicoverpa zea	-
	11128 Schinia arcigera	-
	11149 Schinia trifascia	-
	11164 Schinia florida	-
NYMPHALIDAE - Brush-footed Butterflies	*04420 Polygonia interragationis*	-
	04421 Polygonia comma	-
	04430 Nymphalis vau-album	-
	04432 Nymphalis antiopa antiopa	-
	04434 Vanessa virginiensis	-
	04435 Vanessa cardui	-
	04437 Vanessa atalanta rubria	-
	04440 Junonia coenia	-
	04450 Speyeria cybele cybele	-
	04451 Speyeria aphrodite aphrodite	-
	04451b Speyeria aphrodite alcestis	-
	04465 Boloriaiana bellona	-
	04481 Phyciodes tharos tharos	-
	04491 Chlosyne harrisii harrisii	-

CAMP RAVENNA – ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	**Hodge No.* / Taxon**	**State Status**
NYMPHALIDAE - Brush-footed Butterflies	*04522 Limenitis artemis astyanax*	-
	04523 Limenitis archippus archippus	-
OECOPHORIDAE - Oecophorid Moths	*00880 Agonoptedix flavicomella*	-
	00912 Semioscopis packardella	-
	00951 Machimia tentoriferella	-
	00987b Ethmia monticola fuscipedella	-
	01011 Antaeotricha schlageri	-
	01014 Antaeotricha leucillana	-
PAPILIONIDAE - Swallowtail Butterflies	*04157 Battus philenor philenor*	-
	04159 Papilio polyxenes asterias	-
	04176 Papilio glaucus glaucus	-
	04181 Papilio troilus troilus	-
PIERIDAE - White and Sulfur Butterflies	*04196 Pieris virginiensis*	-
	04197 Pieris rapae	-
	04209 Colias philodice philodice	-
PTEROPHORIDAE - Plume Moths	*06092 Geina tenuidactyla*	-
	06093 Geina buscki	-
	06095 Capperia evansi	-
	06107 Gillmenia pallidactyla	-
	06186 Oidaematophorus inquinata	-
	06203 Oidaematophorus homodactylus	-
	06207 Oidaematophorus paleacus	-
	06214 Oidaematophorus glenni	-
PYRALIDAE -Pyrajid Moths	*04748 Munroessa icciusalis*	-
	04751 Munroessa gyralis	-
	04755 Synclita obliteralis	-
	04761 Parapoynx badiusalis	-
	04897 Evergestis pallidata	-
	04944 Crocidophora senatissimalise	-
	04949 Ostrinia nubilalis	-
	04950 Fumibotys fumalis	-
	04953a Phlyctaenia coronata tertialis	-
	04958a Anania funebris glomeralis	-
	05034 Pyrausta signatalis	-
	05040 Pyrausta bicoloralis	-
	05068 Pyrausta unifascialus	-
	05071 Pyrausta acrionalis	-
	05079 Udea rubigalls	-
	05142 Diacme elealis	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
PYRALIDAE -Pyrajid Moths	*05156 Nomophila neacrtica*	-
	05159 Desmia funeralis	-
	05160 Desmia maculalis	-
	05169 Hymenia perspectalis	-
	05182 Blepharomastix ranalis	-
	05226 Palpita magniferalis	-
	05228 Polygrammodes flavidalis	-
	05241 Pantographa limata	-
	05250 Lygropia rivulalis	-
	05275 Herpetogramma pertextilis	-
	05277 Herpetogramma thestialis	-
	05280 Herpetogramma aeglealis	-
	05355 Crambus praefectellus	-
	05357 Crambus leachellus	-
	05362 Crambus agitatellus	-
	05365 Crambus girardellus	-
	05378 Crambus laqueatellus	-
	05381 Crambus calignosellus	-
	05391 Chrysoteuchia topiaria	-
	05392 Arequipa turbatella	-
	05403 Agriphila vulgivagella	-
	05413 Pediasia trisecta	-
	05420 Microcrambus elegans	-
	05435 Fissicrambus mutabilis	-
	05451 Parapediasia teterrella	-
	05464 Urola nivalis	-
	05465 Vaxi auratella	-
	05510 Pyralis farinalis	-
	05517 Aglossa caprealis	-
	05518 Aglossa cuprina	-
	05524 Hypsopygia costalis	-
	05532 Herculia infimbriata	-
	05533 Herculla olinalis	-
	05552 Galasa nigrinodis	-
	05579 Epipaschia zelleri	-
	05622 Galleria mellonella	-
	05651 Acrobasis indiginella	-
	05794 Nephopterix vetustella	-
	05797 Nephopterix virgatella	-
	05997 Euzophera ostricolorella	-

CAMP RAVENNA – ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	**Hodge No.* / Taxon**	**State Status**
PYRALIDAE -Pyrajid Moths	*06053 Peoria approximella*	-
PSYCHIDAE - Bagwonn Moths	*00443 Astala confederata*	-
SATURNIIDAE - Giant Silkworm and Royal Moths	*07715 Dryocampa rubicunda*	-
	07716 Anisota stigma	-
	07723 Anisota virginiensis	-
	07746 Automeris io	-
	07757 Antheraea polyphemus	-
	07758 Actias luna	-
	07764 Callosamia promethea	-
	07765 Callosamia angulifera	-
	07767 Hyalophora cecropia	-
SATYRIDAE - Satyr and Wood Nymph Butterflies	*04568 Enodia anthedon*	-
	04568.3 Satyrodes eurydice eurydice	-
	04569 Satyrodes appalachia leeuwi	-
	04578 Megisto cymela cymela	-
	04587b Cercyonis pegala alope	-
	04587c Cercyonis pegala nephele	-
SESIIDAE - Clear-winged Moths	*02554 Synanthedon acerni*	-
	02583 Synanthedon exitiosa	-
	02589 Podosesia syringae	-
SPHINGIDAE - Hawk Moths	*07775 Manduca sexta*	-
	07783 Manduca jasminearum	-
	07786 Ceratomia amyntor	-
	07787 Ceratomia undulosa	-
	07789 Ceratomia catalpae	-
	07809 Sphinx kalmiae	-
	07810 Sphinx gordius	-
	07821 Smerinthusjamaicensis	-
	07824 Paonias excaecatus	-
	07825 Paonias myops	-
	07827 Laothoe juglandis	-
	07828 Pachysphinx modesta	-
	07853 Hemaris thysbe	-
	07855 Hemaris diffinis	-
	07870 Sphecodina abbottii	-
	07871 Deidamia inscripta	-
	07873 Amphion floridensis	-
	07885 Darapsa myron	-
	07886 Darapsa pholus	-

CAMP RAVENNA – ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	**Hodge No.* / Taxon**	**State Status**
THYATIRIDAE - Thyatirid Moths	*06235 Habrosyne scripta*	-
	06236 Habrosyne gloriosa	-
	06237 Pseudothyatira cymatophoroides	-
	06240 Euthyatira pudens	-
TINEIDAE- Clothes Moths and Acrolophids	*00373 Acrolophus popeanetia*	-
TORTRICIDAE - Leaf-roller Moth	*02707 Bactra verutana*	-
	02738 Endothenia hebesana	-
	02765 Apotomis deceptana	-
	02769 Pseudosciaphila duplex	-
	02770 Orthotaenia undulana	-
	02776 Olethreutes furfurana	-
	02787 Olethreutes connectus	-
	02788 Olethreutes inomatana	-
	02796 Olethreutes sciotana	-
	02800 Olethreutes nigrana	-
	02804 Olethreutes hamameliana	-
	02812 Olethreutes valdana	-
	02817 Olethreutes permundana	-
	02822 Olethreutes concinnana	-
	02823 Olethreutes fasciatana	-
	02825 Olethreutes exaeresima	-
	02838.1 Olethreutes ferrolineana	-
	02848 Olethreutes bipartitana	-
	02859 Olethreutes cespitana	-
	02861 Hedya ochroleucana	-
	02863 Hedya chionosema	-
	02866 Evora hemidesma	-
	02908 Phaneta radiatana	-
	02910 Phaneta essexana	-
	02916 Phaneta formosana	-
	02925 Phaneta autumnana	-
	02926 Phaneta verna	-
	02927 Phaneta ochrocephala	-
	02929 Phaneta ochroterminana	-
	03007.1 Phaneta ambodaidaleia	-
	03043 Eucosma albiguttana	-
	03074 Eucosma tocullionana	-
	03116 Eucosma dorsisignatana	-
	03116.1 Eucosma similiana	-
	03172 Epiblema strenuana	-

CAMP RAVENNA - ORDER LEPIDOPTERA (BUTTERFLIES AND MOTHS)		
Family	Hodge No.* / Taxon	State Status
TORTRICIDAE - Leaf-roller Moth	*03156 Epiblema scudderiana*	-
	03190 Epiblema desertana	-
	03219 Sonia canadana	-
	03230 Proteoteras aesculana	-
	03234 Proteoteras naracana	-
	03246 Pseudexentera cressoniana	-
	03247 Pseudexentera mali	-
	03251 Pseudexentera spoliana	-
	03333 Catastega timidella	-
	03351 Epinotia lindana	-
	03406 Dichrorampha bittana	-
	03430 Grapholita angelesana	-
	03471 Cydia caryana	-
	03492 Cydia pomonella	-
	03495 Ecdytolopha punctidiscana	-
	03497 Ecdytolopha insiticiana	-
	03542 Acleris flavivittana	-
	03594 Pandemis limitata	-
	03597 Argyrotaenia velutinana	-
	03622 Argyrotaenia juglandana	-
	03623 Argyrotaenia quercifoliana	-
	03624 Argyrotaenia alisellana	-
	03625 Argyrotaenia mariana	-
	03632 Choristoneura fractivittana	-
	03633 Choristoneura parallela	-
	03635 Choristoneura rosaceana	-
	03648 Archips argyrospila	-
	03658 Archips purpurana	-
	03672 Syndemis afflictana	-
	03686 Clepsis melaleucana	-
	03688 Ptycholoma peritana	-
	03690 Adoxophyes furcatana	-
	03693 Sparganothis sulfureana	-
	03695 Sparganothis sulfureana	-
	03697 Sparganothis lycopodiana	-
	03706 Sparganothis xanthioides	-
	03711 Sparganothis unifasciana	-
	03725 Sparganothis pettitana	-
YPONOMEUTIDAE - Ennine Moths	*02401 Atteva punctella*	-
	02420 Yponomeuta multipunctella	-

Camp Ravenna - Order Odonata (Dragonflies and Damselflies)			
Family	**Common Name**	**Scientific Name**	**State Status**
Aeschnidae	Black-tipped Darner	*Aeshna tuberculifera*	-
	Comet Darner	*Anax longipes*	-
	Common Green Darner	*Anax Junius*	-
	Cyrano Darner	*Nasiaeschna pentacantha*	-
	Fawn Darner	*Boyeria vinosa*	-
	Green-striped Darner	*Aeshna verticalis*	-
	Lance-tipped Darner	*Aeschna constricta*	-
	Shadow Darner	*Aeshna umbrosa*	-
	Spatterdock Darner	*Aeschna mutata*	-
	Springtime Darner	*Basiaeschna janata*	-
	Swamp Darner	*Epiaeschna heros*	-
Calopterygidae	Ebony Jewelwing	*Calopteryx maculata*	-
Coenagrionidae	Aurora Damsel	*Chromagrion conditum*	-
	Azure Bluet	*Enallagma aspersum*	-
	Blue-fronted Dancer	*Argia apicalis*	-
	Blue-tipped Dancer	*Argia tibialis*	-
	Citrine Forktail	*Ischnura hastata*	-
	Double-striped Bluet	*Enallagma basidens*	-
	Eastern Forktail	*Ischnura verticalis*	-
	Eastern Red Damsel	*Amphiagrion saucium*	-
	Familiar Bluet	*Enallagma civile*	-
	Fragile Forktail	*Ischnura posita*	-
	Hagen's Bluet	*Enallagma hageni*	-
	Northern Bluet	*Enallagma annexum*	-
	Orange Bluet	*Enallagma signatum*	-
	Powdered Dancer	*Argia moesta*	-
	Rainbow Bluet	*Enallagma antennatum*	-
	Sedge Sprite	*Nehalennia irene*	-
	Sphagnum Sprite	*Nehalennia gracilis*	-
	Skimming Bluet	*Enallagma geminatum*	-
	Stream Bluet	*Enallagma exsulans*	-
	Tule Bluet	*Enallagma carunculatum*	-
	Turquoise Bluet	*Enallagma divigans*	-
	Vesper Bluet	*Enallagma vesperum*	-
	Violet Dancer	*Argia fumipennis violacea*	-
	Western Slender Bluet	*Enallagma traviatum wesifalli*	-
Cordulegastridae	Arrowhead Spiketail	*Cordulegaster obliqua*	-
	Delta-spotted Spiketail	*Cordulegaster diastatops*	-

Camp Ravenna - Order Odonata (Dragonflies and Damselflies)			
Family	**Common Name**	**Scientific Name**	**State Status**
Cordulegastridae	Twin-spotted Spiketail	*Cordulegaster maculata*	-
Corduliidae	Beaverpond Baskettail	*Epitheca canis*	-
	Brush-tipped Emerald	*Somatochlora walshii*	E
	Clamp-tailed Emerald	*Somatochlora tenebrosa*	-
	Common Baskettail	*Epitheca cynosura*	-
	Mocha Emerald	*Somatochlora linearis*	-
	Prince Baskettail	*Epitheca princeps*	-
Gomphidae	Ashy Clubtail	*Gomphus lividus*	-
	Black-shouldered Spinyleg	*Dromogomphus spinosus*	-
	Dragonhunter	*Hagenius brevistylus*	-
	Lancet Clubtail	*Gomphus exilis*	-
	Laura's Clubtail	*Stylurus laurae*	-
	Least Clubtail	*Stylogomphus albistylus*	-
	Unicorn Clubtail	*Arigomphus villosipes*	-
Lestidae	Amber-winged Spreadwing	*Lestes eurinus*	-
	Common Spreadwing	*Lestes disjunctus disjunctus*	-
	Elegant Spreadwing	*Lestes inaequalis*	-
	Emerald Spreadwing	*Lestes dryas*	-
	Great Spreadwing	*Archilestes grandis*	-
	Slender Spreadwing	*Lestes rectangularis*	-
	Southern Spreadwing	*Lestes disjunctus australis*	-
	Spotted Spreadwing	*Lestes congener*	-
	Swamp Spreadwing	*Lestes vigilax*	-
	Sweetflag Spreadwing	*Lestes forcipatus*	-
Libellulidae	Autumn Meadowhawk	*Sympetrum vicinum*	-
	Band-winged Meadowhawk	*Sympetrum semicinctum*	-
	Black Saddlebags	*Tramea lacerata*	-
	Blue Dasher	*Pachydiplax longipennis*	-
	Calico Pennant	*Celithemis elisa*	-
	Carolina Saddlebags	*Tramea carolina*	-
	Common Whitetail	*Plathemis lydia*	-
	Dot-tailed Whiteface	*Leucorrhinia intacta*	-
	Eastern Amberwing	*Perithemis tenera*	-
	Eastern Pondhawk	*Erythemis simplicicollis*	-
	Four-spotted Skimmer	*Libellula quadrimaculata*	-
	Great Blue Skimmer	*Libellula vibrans*	-
	Halloween Pennant	*Celithemis eponina*	-
	Painted Skimmer	*Libellula semifasciata*	-
	Ruby Meadowhawk	*Sympetrum rubicundulum*	-
	Slaty Skimmer	*Libellula incesta*	-

Camp Ravenna - Order Odonata (Dragonflies and Damselflies)			
Family	**Common Name**	**Scientific Name**	**State Status**
Libellulidae	Spangled Skimmer	*Libellula cyanea*	-
	Spot-winged Glider	*Pantala hymenea*	-
	Twelve-spotted Skimmer	*Libellula pulchella*	-
	Wandering Glider	*Pantala flavescens*	-
	White-faced Meadowhawk	*Sympetrum obtrusum*	-
	Widow Skimmer	*Libellula luctuosa*	-
Odontoceridae	Caddisfly	*Psilotreta indecisa*	T

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APPENDIX E
LAWS AND REGULATIONS

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LAWS, REGULATIONS, AND EXECUTIVE ORDERS

FEDERAL

American Indian Religious Freedom Act (42 USC §1196) – requires the U.S. to protect and preserve religious rights of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

Animal Damage Control Act (7 USC §426 *et seq.*) – provides broad authority for investigation, demonstrations and control of mammalian predators, rodents and birds.

American Antiquities Act of 1906 (16 USC §431-433) – provides for the protection of items of archeological significance, both historic and prehistoric.

Archeological and Historical Preservation Act of 1974 (16 U.S.C 469 *et seq.*) – provides for the preservation of historical and archeological data (including relics and specimens).

Archeological Resources Protection Act of 1979 (16 USC §470 *et seq.*) – prohibits the excavation or removal from Federal or Indian lands any archeological resources without a permit from the land manager.

Bald Eagle Protection Act (16 USC §668a-d) – prohibits taking or harming bald or golden eagles, their eggs, nests, or young without appropriate permit.

Clean Air Act, as amended (42 USC §7401 *et seq.*) – regulates air emissions from area, stationary, and mobile sources. This law authorizes the USEPA to establish NAAQS to protect public health and the environment.

Clean Water Act (CWA): Section 401 Water Quality Certification, 1986, 33 USC §1341 – requires state certification of federal permits that result in actions that discharge into navigable waters. Under Section 401, states have authority to review federal permits that may result in a discharge to wetlands or waterbodies under state jurisdiction.

Clean Water Act (CWA): Section 404, Permits for Dredged or Fill Material, 1977, 33 USC §1344 – establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees),infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404regulation (e.g. certain farming and forestry activities.

Endangered Species Act of 1973, as amended (16 USC §1531 *et seq.*) – provides for the identification and protection of threatened and endangered plants and animals and their critical habitats. Requires federal agencies to conserve T/E species and cooperate with State and local authorities to resolve water resources issues in concert with the conservation of T/E species.

Environmental Safeguard for Activities for Animal Damage Control on Federal Lands (EO 11870) – restricts the use of chemical toxicants for mammal and bird control.

Federal Insecticide, Fungicide, and Rodenticide Act (7 USC §136) – Governs the use and application of pesticides in natural resource management programs.

Federal Land Policy and Management Act (43 USC §1701) – Establishes public land policy and guidelines for its administration and provides for the management, protection, development, and enhancement of the public lands.

Federal Noxious Weed Act of 1974 (7 USC §2801 *et seq.*) – Establishes control and eradication of noxious weeds and regulates them in interstate and foreign commerce.

Federal Water Pollution Control Act as amended by the CWA of 1977 (33 USC §1251) – Regulates dredging and filling of wetlands and waterbodies and establishes procedures for identifying and regulating non-point sources of pollutants, including turbidity, into waterways.

Federal Water Pollution Control Act: Section 404, as amended by the CWA of 1977 (33 USC §1251) – Prohibits the discharge of dredged or filled materials into waters of the United States, including wetlands, without first obtaining a permit from USACE. Activities in wetlands that require federal permits include, but are not limited to: placement of fill material; ditching activities when the excavated material is sidecast, mechanized land clearing; land leveling; and most road construction.

Fish and Wildlife Conservation Act (16 USC §2901) – Provides for the protection of non-game fish and wildlife.

Fish and Wildlife Coordination Act (16 USC §661 *et seq.*) – Provides mechanism for wildlife conservation to receive equal consideration and be coordinated with water-resource development programs.

Floodplain Management (EO 11988) – Requires agencies to assess the effects that their actions may have on floodplains and to consider alternatives to avoid adverse effects and incompatible development on floodplains.

Forest and Rangeland Renewable Resources Planning Act (16 USC §1601 *et seq.*) – Requires and inventory of potential renewable resources and an evaluation of opportunities for improving their yield on goods and services. Agencies must provide an opportunity for public involvement and consultation with other agencies in establishing policies for multiple use and sustained yield.

Greening the Government through Leadership in Environmental Management (EO 13148) – This EO (Section 207, Environmentally and Economically Beneficial Landscaping) states that "each agency shall strive to promote the sustainable management of Federal facility lands through the implementation of cost-effective, environmentally sound landscaping practices, and programs to reduce adverse impacts to the natural environment."

Hunting and Fishing on Federal Lands (10 USC §2671 *et seq.*) – establishes requirements for regulating hunting, fishing, and trapping on military lands.

Indian Sacred Sites (EO 13007) – Provides for the protection of and access to Indian sacred sites.

Invasive Species (EO 13112) – Requires Federal agencies to: "prevent the introduction of invasive species"; "detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner"; "monitor invasive species populations accurately and reliably, provide for restoration of native species and habitat conditions in ecosystems that have been invaded"; "conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species"; and "promote public education on invasive species and the means to address them."

Land and Water Conservation Act of 1965 (16 USC §4601 *et seq.*) – assists in preserving, developing, and assuring accessibility to outdoor recreation resources.

Legacy Resource Protection Program Act (P.L. 101-511) – established a program for the stewardship of biological, geophysical, cultural and historic resources on DoD lands.

Migratory Bird Conservation Act (16 USC §715 *et seq.*) – Establishes a Migratory Bird Conservation Commission to approve areas recommended by the Secretary of the Interior for acquisition with Migratory Bird Conservation Funds.

Migratory Bird Treaty Act, as amended (16 USC §703-712) – Prohibits the taking or harming of a migratory bird, its eggs, nests, or young without the appropriate permit.

National Aquatic Invasive Species Act of 2003 (NAISA). Federal legislation to combat invasive aquatic species introduced.

National Environmental Policy Act of 1969, as amended (42 USC §4321) – Provides a national charter for protection of the environment and requires Federal agencies to prepare a statement of environmental impact in advance of each major action that may significantly affect the quality of the human environment.

National Historic Preservation Act of 1966 (16 USC §470 *et seq.*) – provides for the preservation of historic properties throughout the U.S.

Native American Graves Protection and Repatriation Act (NAGPRA) – NAGPRA establishes that Native American human remains and associated funerary objects found on federal or tribal lands belong to the direct lineal descendants of these remains.

Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C 4701 *et seq.*) – established a program to prevent the introduction of and to control the spread of introduced aquatic nuisance species and the brown tree snake.

Off Road Vehicle Use on Public Lands (EO 11989) – limits the use of off-road vehicles on federal lands soil, water, or natural resources could be adversely affected.

Oil Pollution Prevention Act of 1990, Public Law 101-380 – Redefines the requirements of the National Contingency Plan to include planning for, rescue of, minimization of injury to, and assessment of damages for injury to fish and wildlife resources.

Outleasing for Grazing and Agriculture on Military Lands (10 USC §2667) – provides for the outleasing of public lands.

Protection and Enhancement of Environmental Quality (EO 11514) – provides for environmental protection of federal lands and enforces requirements of NEPA.

Protection and Enhancement of the Cultural Environment (EO 11593) – supports previous laws and provides for additional protection of cultural resources.

Protection of Wetlands (EO 11990) – requires agencies to take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the beneficial values of wetlands.

Recreational Fisheries (EO 12962) – requires Federal agencies, to the extent practicable and where permitted by law, "to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities".

Sale of Certain Interests in Land, Logs (10 USC §2665) – Authorizes the sale of forest products and the reimbursement of the costs of managing forest resources for timber production.

Sikes Act "Conservation Programs on Military Reservations" (16 USC §670a *et seq.*) – Requires Federal military installations with adequate wildlife habitat to implement cooperative agreements with other agencies and develop long-range integrated natural resources management plans. Thereby, it is appropriate to manage natural resources for multipurpose uses and provide the public access to those uses to the extent consistent with the military mission. The act also sets guidelines for the collection of fees for the use of natural resources such as hunting and fishing.

Soil Conservation Act (16 USC §590a *et seq.*) – provides for soil conservation practices on Federal lands.

STATE

OAC 901:5-37-01, Prohibited noxious weeds. Provides a list of prohibited noxious weeds for Ohio. See also ORC 5579.05. Notice to destroy weeds. The list includes:

(A) Shatter cane (Sorghum bicolor).

(B) Russian thistle (Salsola Kali var. tenuifolia).

(C) Johnsongrass (Sorghum halepense L. (Pers.)).

(D) Wild parsnip (Pastinance sativa).

(E) Wild carrot (Queen Annes lace) (Daucus carota L.).

(F) Oxeye daisy (Chrysanthermum leucanthemum var. pinnatifidum).

(G) Wild mustard (Brassica kaber var. pinnatifida).

(H) Grapevines: when growing in groups of one hundred or more and not pruned, sprayed, cultivated, or otherwise maintained for two consecutive years.

(I) Canada thistle (Cirsium arvense L. (Scop.)).

(J) Poison hemlock (Conium maculatum).

(K) Cressleaf groundsel (Senecio glabellus).

(L) Musk thistle (Carduus nutans).

(M) Purple loosestrife (Lythrum salicaria).

(N) Mile-A-Minute Weed (Polygonum perfoliatum).

(O) Giant Hogweed (Heracleum mantegazzianum).

(P) Apple of Peru (Nicandra physalodes).

(Q) Marestail (Conyza canadensis)

Related Ohio Weed Laws include:

- **ORC 5579.05. Notice to destroy weeds.** Provides a mechanism under (B) for noxious weeds identified on state land be addressed. The law gives authority to townships to meet with the state and make recommendations. See OAC 901:5-37-01, Prohibited noxious weeds for list of plants included.

- **OAC 731:51 - 731.53** - Gives municipal corporations the authority to eliminate noxious weeds from properties.

- **OAC 927:681** - Multiflora Rose. Multiflora rose may be used by licensed nurseries as rootstocks for other rose species. To use this plant for any other reason, a special permit is needed from the Ohio Department of Agriculture. Multiflora rose is a thorny and invasive woody plant. It is difficult to eliminate once established. Note: multiflora rose can be distinguished from other roses by the presence of fringe-like stipules at the leaf bases.

- **OAC 927:682** - Lythrum salicaria (Purple Loosestrife). A permit is required from the Ohio Department of Agriculture to sell or plant Lythrum salicaria. The permit allows the sale and planting of sterile varieties of Lythrum that do not threaten native habitats.

- **OAC 4959.11** - Gives managers of toll roads or railroads authority to destroy certain listed weeds and brush.

- **OAC 5579.04 - 5579.08** - Gives highway departments and township trustees authority to control noxious weeds.

OAC 1501:15-5-12, Erosion from silvicultural operations. In order to abate wind or water erosion of the soil and to control pollution of waters of the state, the owner, operator or person responsible for silvicultural operations shall apply conservation practices and follow an operation and management plan in accordance with the "Field Office Technical Guide" and "BMPs For Erosion Control On Logging Jobs", which are available to all Ohio County Soil and Water Conservation Districts, and may file such plans with the soil and water conservation district in the county where such operations are performed.

OAC 1501:31-13-01, Sport fishing. This regulation allows fish to be taken in any number and of any size unless otherwise restricted by the Ohio Revised Code or other rules of the wildlife division.

OAC 1501:31-15, Hunting and Trapping. This regulation pertains to game hours and bag limits, nuisance wild animals, and general hunting and trapping provisions.

OAC 1501:31-7, Migratory Game Birds. These provisions pertain to migratory game bird possession limits, purposes for possessing them, and seasons and limits.

OAC § 3745-1, Ohio's Water Quality Standards. This rule addresses beneficial use designations, water quality criteria and values, and anti-degradation provisions for surface waters. Many of the provisions that apply to surface water bodies also apply to wetlands.

ORC 6111, Isolated Wetlands. This rule incorporates the provisions of the House Bill 231, which prevents the loss of isolated wetlands, signed into law on 17 July 2001.

ORC Section 1518 Endangered Species. Pertains to rules for identifying endangered plant species, the use of them commercially, and the violations and penalties associated with injuring and removing them.

ORC § 1531.25, Protection of species threatened with statewide extinction. Pertains to restrictions on taking or possessing native wildlife, or any eggs or offspring thereof, that are considered threatened with statewide extinction. This includes all species on the list of endangered fish and wildlife that are native to the state, or that might migrate or are otherwise reasonably likely to occur within the state. The rules shall provide for the taking of species threatened with statewide extinction, for zoological, educational, and scientific purposes, and for propagation in captivity to preserve the species, under written permits from the chief of wildlife.

DoD Regulations and Guidance

DoDI 4715.03	**E**nvironmental Conservation Program
32 CFR 651	Environmental Effects of Army Actions
AR 200-1	Environmental Protection and Enhancement
TM 5-633	Fish and Wildlife Management
TM 5-631	Forest Management
AR 405-80	Granting Use of Real Estate
TM 5-630	Land Management
TC 25-1	Training Land
AR 210-9	Use of Off-Road Vehicles on Army Lands
DoDI 4150.7M	DoD Pest Management Training and Certification
DoDI 4150.7P	DoD Plan for the Certification of Pesticide Applicators
AR 350-19	**Army Sustainable Range Program**
ARNG-ILE	**Guidance for the Creation, Implementation, Review, and Revision and Update of INRMP**

Ohio Army National Guard
CAMP RAVENNA JOINT MILITARY TRAINING CENTER

CRJMTC REGULATION
NO. 200-3

23 October 2013

TRAINING SITE REGULATION
HUNTING, FISHING, and TRAPPING

1. **Purpose:** The purpose of this regulation is to prescribe the policies and procedures for hunting, fishing, and trapping at Camp Ravenna Joint Military Training Center (CRJMTC).

2. **Scope:** This regulation applies to all persons authorized to hunt, fish or trap on CRJMTC.

3. **Policies:**

a. The Ohio Army National Guard (OHARNG) is the lead agency for natural resources management at CRJMTC and will manage the hunting, fishing, and trapping programs.

b. Hunting, fishing, and trapping are authorized at CRJMTC by the Garrison Commander in conformity with existing Federal and State game laws, Army regulations, and the Integrated Natural Resources Management Plan (INRMP).

c. Access to CRJMTC for hunting, fishing, and trapping is a privilege not a right and is subject to all security and safety requirements and subordinate to land use for military mission purposes. Access privileges may be denied, revoked, or suspended at any time or modified to facilitate mission needs and to ensure the safety and security of the public and/or government property. Public access will be available when compatible with the military mission, security, and safety requirements. Access eligibility will be identified by program in this regulation and the INRMP.

d. CRJMTC permits to hunt, fish, or trap will be distributed to eligible participants as described in this regulation. Membership in a conservation club or rod and gun club will not be a prerequisite for or get priority in receiving permits or authorization to hunt, fish, or trap on CRJMTC.

e. All individuals eligible to hunt, fish, or trap at CRJMTC must possess a valid Ohio hunting, fishing, or trapping license; other applicable Ohio required tags such as deer and turkey tags; current Federal and State waterfowl stamps/registration (for waterfowl hunting); and the applicable CRJMTC letter permit.

f. An administration fee will be charged in accordance with the fee schedule identified in this regulation.

g. Concurrent Legislative jurisdiction exists over CRJMTC. The penal laws of the State of Ohio relative to firearm usage, hunting, fishing, and trapping are enforceable by Ohio law enforcement officials. Violations of State law and this regulation may also be a Federal offense under 10 USC 267(c).

4. **Responsibilities:**

a. The CRJMTC Garrison Commander will review and approve this regulation to ensure compatibility with the military mission and compliance with safety and security requirements.

b. The CRJMTC Environmental Office (EO) will develop hunting, fishing, and trapping regulations and procedures and administer the programs on behalf of the Garrison Commander. The CRJMTC EO will coordinate and facilitate interagency cooperation with federal and state wildlife management agencies.

c. Persons holding hunting, fishing, or trapping permits are responsible for absolute compliance with this regulation and/or other special instructions and procedures.

5. **Procedures**

a. **Eligibility:** Only individuals without a felony record are eligible to hunt, fish, and trap at CRJMTC. Eligible personnel are listed below by program area. Eligibility does not guarantee access privileges. The Garrison Commander may require a background check from any or all participants as a requirement for eligibility and may deny access and/or revoke a permit/access of any person at his/her discretion. The Garrison Commander/EO may authorize additional access for hunting, fishing, trapping, or related recreational activities for individuals, groups, and/or special events without the need to revise this regulation.

All otherwise eligible personnel must also meet any Ohio Department of Natural Resources, Division of Wildlife training and/or certification requirements such as hunter/trapper safety training requirements.

(1) Deer Shotgun Hunting:

  (a) General Public - All U.S. citizens 18 years and older and U.S. citizens less than 18 years old when accompanied by a qualified adult 18 years or older.
  (b) Military – Active duty U.S. military personnel, retired military personnel, AGR military personnel, full time military technicians, M-day soldiers, other reserve component military personnel, and all personnel permanently assigned to CRJMTC as their duty or work station.

(2) Deer Bow Hunting: All personnel permanently assigned to CRJMTC as their duty or work station and qualified escorted guests.
(3) Waterfowl Hunting: All personnel permanently assigned to CRJMTC as their duty or work station and qualified escorted guests.
(4) Small Game Hunting: All personnel permanently assigned to CRJMTC as their duty or work station and qualified escorted guests.
(5) Turkey Hunting: All personnel permanently assigned to CRJMTC as their duty or work station and qualified escorted guests.
(6) Youth Turkey: All youth as defined in the Ohio Division of Wildlife regulations. Must be a U.S. citizens and accompanied by a qualified adult.
(7) Trapping: All adult U.S. citizens 18 years and older and U.S. citizens less than 18 years old when accompanied by a qualified adult.
(8) Fishing:
  (a) All personnel permanently assigned to CRJMTC as their duty or work station and qualified escorted guests.
  (b) All soldiers during off duty hours while training at CRJMTC.

b. **Administration Fees:** An administration fee will be charged to hunters and fishermen. These fees will be used only at CRJMTC for the protection, conservation, and management of fish and wildlife, including habitat restoration and improvement, biologist staff and support costs, and related activities to implement the INRMP. The following administration fees will be charges to all eligible participants who receive a CRJMTC permit to hunt or fish. For items (2) through (8) a maximum combined fee of $10.00 will be charged for any combination of permits.

(1) Shotgun Deer Hunting: Permit holders will be charged $5.00.
(2) Bow Deer Hunting: Permit holders will be charged $5.00 annually.
(3) Waterfowl Hunting: Permit holders will be charged $5.00 annually.
(4) Small Game Hunting: Permit holders will be charged $5.00 annually.
(5) Turkey Hunting: Permit holders will be charged $5.00 annually.
(6) Youth Turkey Hunting: There is no charge.
(7) Trapping: There is no charge.
(8) Fishing:
    (a) All CRJMTC permanently assigned personnel will be charged $5.00 annually.
    (b) Soldiers training at the CRJMTC will not be charged.
(9) Special Events/Programs: There is no charge for authorized special events such as picnics at Cobb's Pond or Boy Scott camping where fishing is permitted.

c. **Selection of Participants:** The following methods will be used to select participants.

(1) Shotgun Deer Hunt
    (a) The ODOW will solicit applications from the general public and randomly select participants. Each year CRJMTC and ODOW will determine the number of hunters to be drawn.
    (b) CRJMTC will solicit applications from those eligible as military and select participants to fill available military hunting areas.
(2) Bow Deer Hunt: CRJMTC will issue permits to eligible participants.
(3) Waterfowl Hunt: CRJMTC will issue permits to eligible participants.
(4) Small Game Hunting: CRJMTC will issue permits to eligible participants.
(5) Turkey Hunting: CRJMTC will issue permits to eligible participants.
(6) Youth Turkey Hunting: The ODOW will solicit applications from the general public and randomly select participants.
(7) Trapping: CRJMTC will issue permits to eligible participants.
(8) Fishing: CRJMTC will issue permits to eligible participants or place them on a special event access roster.
(9) Special Events/Programs: CRJMTC will issue permits to eligible participants or place them on a special event access roster.

d. **Seasons and Bag Limits:**

(1) Hunting, fishing, and trapping seasons and bag limits at CRJMTC will generally be in accordance with State of Ohio regulations.
(2) Each year CRJMTC EO will recommend to the Garrison Commander whether or not to open a particular season. Seasons will be open as approved by the Garrison Commander.
(3) CRJMTC may designate particular days, times, and locations for seasons and bag limits which are more restrictive than those established by the Ohio Division of Wildlife.
(4) For shotgun deer hunting special out of season dates and bag limits will be established each year. All dates and bag limits that differ from Ohio regulations will be reviewed and approved by the Ohio Division of Wildlife.

e. **Safety:** All individuals authorized to hunt, fish, or trap at CRJMTC must comply with installation safety requirements. Specific safety requirements are identified for each program in the appendices to this regulation. Some general safety requirements include the following.

(1) Shooting is not permitted across roads, through fences, in the direction of buildings, or within designated no hunting zones.
(2) Unauthorized personnel are not permitted within environmental Areas of Concern or Munitions Response Sites.
(3) Loaded weapons are not permitted in vehicles.
(4) All participants are required to receive a rules and safety briefing given by CRJMTC Environmental Office or designee prior to accessing CRJMTC for the purpose of hunting, fishing, or trapping.

f. **Security:** All individuals authorized to hunt, fish, or trap at CRJMTC must comply with installation security requirements. Each program has been developed and designed to comply with current security requirements. Program modifications can be made at any time to comply with changes in security requirements and/or Force Protection level. Some general security requirements include the following.

(1) All persons entering CRJMTC must possess a valid CRJMTC permit or be listed on a Special Event Access Roster.
(2) All persons entering CRJMTC must sign in and out in accordance with the specific program requirements.
(3) Privately owned vehicles are not permitted within restricted areas unless approved in advance by an authorized CRJMTC representative.
(4) Privately owned vehicles are not permitted within tracked vehicle training areas unless approved in advance by an authorized CRJMTC representative.
(5) Unescorted access to CRJMTC is not permitted except as authorized within each specific program and when appropriate oversight and control measures have been established.
(6) Each participant is required to complete and sign the Information and Certification Form in Appendix A.

g. **Program Specifics:** The specific program procedures and information are included in Appendices B (Controlled Deer Hunt Rules and Procedures), C (Deer Bow Hunt Rules and Procedures), D (Waterfowl Hunting Rules and Procedures), E (Small Game Hunting Rules and Procedures), F (Turkey Hunting Rules and Procedures), G (Youth Turkey Hunting Rules and Procedures), H (Trapping Rules and Procedures), I (Employee Fishing Rules and Procedures), and J (Trainee Fishing Rules and Procedures). These appendices may be revised and updated to reflect program changes as necessary without the need to revise this regulation.

6. **References**

a. AR 200-1
b. CRJMTC Integrated Natural Resources Management Plan
c. AR 190-11
d. DA Pam 385-64
e. AGOH PAM 210-1 (ARMY), SECTION 16

CRJMTC Garrison Commander:

William E. Meade
William E. Meade
LTC, OHARNG

Appendices: As stated

Camp Ravenna Joint Military Training Center
Hunter, Fisher, Trapper Information & Certification Form

This form must be completed by all individuals who access the Camp Ravenna Joint Military Training Center (CRJMTC) for the purpose of hunting, fishing, or trapping. Each individual issued a permit to hunt, fish, or trap at CRJMTC has been provided with detailed information on the conduct of that activity. The permit holder(s) is (are) responsible for sharing this information with all individuals in their authorized party.

_____ _____

Date: Hunt/Trapping Area (as applicable)

Please print all personal information, read, and sign the form below only if all statements are true for you.

Last Name - _____

First Name - _____ M.I. - _____

Address - _____

City - _____ State - _____ Zip - _____

Birth Date - _____ Phone _____

Complete certification statement by reading the below statements and indicate your concurrence with your signature and date. I certify under penalty of perjury that:

A. I am not a fugitive from justice.
B. I am not under indictment for or been convicted of a felony offense of violence.
C. I am not under indictment for or been convicted of any offense involving illegal possession, use, sale, administration, distribution or trafficking in any drug of abuse.
D. I am not drug dependent, in danger of being drug dependent, or a chronic alcoholic.
E. I am not currently adjudged mentally incompetent.
F. I have not been adjudicated a juvenile delinquent because of an offense described in paragraphs B and C above.
G. I have not been convicted of a misdemeanor offense of domestic violence.
H. I have read the rules for the CRJMTC hunting, fishing, or trapping activity I am participating in.
I. I have possession of a valid hunting, fishing, or trapping license and permit(s) as applicable.

I further acknowledge that there are no emergency medical facilities at CRJMTC and if I require medical attention a local EMS will be notified and I am responsible for and will pay the cost.

_____ _____

Signature (Legal Guardian if under 18 years old) Date

Cell Number: _____

Emergency POC Name and Phone #:

_____

CAMP RAVENNA JOINT MILITARY TRAINING CENTER (CRJMTC)
CONTROLLED DEER HUNT RULES AND PROCEDURES

1. Read and follow these instructions. This hunt is subject to all wildlife regulations found in ORC 1531 & 1533 and OAC 1501:31-15. Failure to comply with Ohio laws, these rules, or verbal instructions given on the day of the hunt will result in immediate termination of hunting privileges and may result in criminal prosecution. If one member of a hunting pair is found in violation, both hunters will be escorted from the installation and may be banned from future access to CRJMTC.

2. Only the Primary Hunter is issued a letter permit. Write the name and address of the hunt partner next to the primary hunter's information. Both hunters must complete a CRJMTC Certification Statement. This form is available on-line along with your letter permit, a parking pass and these rules and procedures. A Certification Statement for both hunters must be completed and turned in at the registration table on the day of your hunt. Bring your letter permit, completed Certification Statements and blank parking pass with you into the registration building. You must show your permit at the entrance gate to gain access to the training site. Hunters may hunt only one time per season at CRJMTC.

3. Permits are transferable to someone who has not already hunted at CRJMTC during the current season by completing the transfer information on the back of the permit. Whoever is actually coming to hunt is the one who must fill out and sign the Certification Statement on the permit.

4. The type of deer the Primary Hunter may harvest will be determined annually and designated by hunt date (Antlerless Only or Either Sex). For either sex hunts, only the Primary Hunter may shoot an antlered deer. Partners (Secondary Hunter) may only shoot antlerless deer regardless of the type of hunt. Accommodations can be made to switch names on the either sex permit at the registration table. Do not transfer your permit for this purpose. During women's hunts only women will be permitted to harvest an Antlered deer.

5. You must have a State of Ohio hunting license and deer permits in accordance with Ohio law to hunt deer at CRJMTC. Both hunters may take a maximum of two deer per hunt day as long as they have enough deer permits. If the hunt is an either sex hunt, one of the deer taken by the Primary Hunter may be an antlered deer as long as he/she has the proper deer permit and has not already harvested an antlered deer elsewhere in Ohio. The hunting partner may only take antlerless deer regardless if the hunt is designated either sex or antlerless only. The Ohio Division of Wildlife allows the use of Antlerless Deer Permits at CRJMTC for the harvest of antlerless deer. Deer Permits are not sold on site. All deer shot must be temporarily tagged according to current Ohio deer harvest regulations and brought to bldg 1067 so biological data can be collected. You may shoot two deer and temporarily tag them before bringing them to bldg 1067. You are responsible for calling in to register your deer in accordance with current Ohio Division of Wildlife regulations.

6. All hunters must wear hunter orange in accordance with state regulations. This orange must be on whenever the individual is outside of their vehicle. Hunter orange must be worn into the check-in building in the morning. We strongly recommend wearing at minimum a hunter orange hat and a hunter orange vest or coat.

7. Only 10, 12, 16, 20, 28, and .410 gauge shotguns are permitted. No handguns, rifles, muzzle-loading firearms, longbows or crossbows may be used or brought into the facility.

8. Tree stands and ground blinds are not permitted on the facility except for mobility impaired hunters may use ground blinds. All hunting must be done from the ground. Hunters may not climb trees, enter buildings, or climb water towers.

9. Hunters should arrive at the main gate on State Route 5 between 5:00 and 5:45 a.m. on the day of their hunt. Arriving later causes a delay in the pre-hunt briefing and a late start to the hunt. Entry will not be permitted after the gate is closed. The gate is about nine miles east of Ravenna. The address of the access gate is 8451 State

Route 5, Ravenna, OH 44266. There is no outside lighting along the highway at the main gate, so drive carefully when turning onto the base.

10. Hunters must be ready to present their letter permit at the gate. Hunters will need their letter permit, parking pass, completed Certification Statements, hunter orange and positive identification, including their hunting license, when they go into bldg 1067 to register. Hunters must have the letter permit with them at all times while on post. Leave your firearms in your vehicle when you go into bldg 1067 to register.

11. Loaded shotguns are not permitted in vehicles under Section 2923.16 of the Ohio Revised Code. When transporting a firearm on base it must be in a case and secured out of your reach in the trunk or bed of your vehicle. Your firearm and ammunition must be transported in separate compartments and/or both must not be readily accessible to vehicle occupants.

12. All hunters and Amish taxi drivers must report to check-in at building 1067 after your vehicle has been searched. The Ohio Army National Guard will collect a $5.00 (cash only) user fee when you register in building 1067. This fee will be charged to all hunters. After registration and the safety briefing, hunters will drive to their designated parking areas. Under no circumstances may hunters stop along the way to hunt. All hunting will be from designated parking lots and assigned hunting areas. If a car breaks down, both hunters will stay with the car until help arrives. Hunters are responsible for paying for towing and/or repair.

13. All hunters will be met by volunteer escorts (VEs) at their parking lot. Hunt pairs will be directed by a VE to their designated hunting area. Pairs must hunt within their assigned area. Each pair will receive a map of their hunting area on the day of the hunt. If a wounded deer goes out of your assigned area, get help from the VE to track it. The VEs are there to help you and facilitate your access to the installation. Please listen to their instructions. Do not leave your assigned hunting area and enter any other area unless you are with a VE. The VEs will be in the field monitoring the perimeter of your hunting area and they are permitted to hunt.

14. Hunters may leave at anytime during the day. The hunt ends at 4:00 p.m. Shooting is not permitted after this hour. All hunters, whether successful or not, and Amish taxi drivers, must return to building 1067 to sign out. Hunters may not leave CRJMTC and re-enter. Amish taxi drivers may stay all day in their vehicle at the designated parking area or leave after dropping off their hunters and come back no later than 3:00 p.m. to pick them up. Taxi drivers must sign in and out at bldg. 1067 each time they leave and come back.

15. Vehicles must be parked at their assigned parking lot, unless picking up a field-dressed deer in a non-restricted area. Vehicles are not permitted off-road. Hunters may travel on roads in non-restricted areas to pick up field-dressed deer. Joyriding and sight seeing are not permitted. Both hunters must ride in one vehicle.

16. Hunters may not discharge their firearm within 1,200 feet of the installation perimeter fence, buildings, boxcars, and trailers unless they are certain they are not firing in the direction of such objects. Those hunting along the perimeter fence must be extra careful of the direction of their shots. There is a 100 to 600 foot No Hunting Zone around the entire perimeter fence, and a 1,200 foot No Hunting Zone within the Charlestown Hill area. These zones are clearly marked on the maps you will receive the day of the hunt. Shooting across roads, through fences, and from buildings, boxcars and trailers is prohibited.

17. If snow is on the ground, the roads will not be plowed. Some roads are in bad shape. Hunters must provide suitable transportation. Vehicles must be safe and have working exhaust systems. Campers, recreational vehicles, four-wheelers, three-wheelers, or other recreational vehicles are not permitted.

18. In the event of an emergency, you will be signaled to return to your parking area with repeated horn blasts. If you hear such blasts, return to your designated parking area immediately. A hunter aware of an injury or other emergency shall immediately go to building 1067 and report the incident. Hunters shall also report any complaints about VEs to CRJMTC hunt coordinator.

19. Smoking is permitted only in the parking lot of building 1067. Hunt officials will have a lighter. Cigarette butts may not be thrown on the ground. Hunters must take all litter with them when they leave. Littering will not be permitted anywhere on the installation. Portable restroom facilities are available at building 1067.

20. You are not permitted to remove anything from CRJMTC except for legally tagged deer. Do not remove bottles, antlers, firewood, or any other artifact found in the field. Do not shoot any other animal or bird. Do not shoot albino or piebald deer.

21. Hunters must be physically capable of hunting alone, without assistance. If you are not physically fit to hunt, field dress, and drag a deer, please do not attend the hunt. Special provisions will be made only for those selected as Mobility Impaired hunters. If you require medical attention while at CRJMTC, a local EMS will be called and you will be responsible for the costs. For emergencies call **Range Control at 614-336-6041**.

22. Mobility Impaired Hunters assigned to area 45 are permitted to hunt either sex deer during all the hunts. They are required to have a non-hunting partner to assist them with their special needs and must bring a doctor's proof of their impairment. Mobility Impaired Hunters may use a ground blind in exception to item 24c, below.

23. Beaver flooding occasionally puts parts of hunting areas under water. Hunters may want to bring waterproof hip boots along with hunting boots just incase part of your area is wet.

24. All personnel and vehicles will be searched and prohibited items may be seized. The following items are not permitted on post. Do not bring them with you. The government is not responsible for seized items that are lost or stolen.

a) handguns, rifles, black powder guns of any kind, longbows, or crossbows
b) alcoholic beverages, narcotics, or illegal drugs of any kind
c) tree stands and/or ground blinds

25. You are permitted to bring cameras, binoculars, cellular telephones, portable two-way radios, and hand held GPS units. You may not use electronic communication devices as hunting aids. You are permitted to have them and use them for your personal safety and emergency communication.

CAMP RAVENNA JOINT MILITARY TRAINING CENTER (CRJMTC)
DEER BOW HUNTING RULES AND PROCEDURES

1. Read and follow these instructions. Failure to comply with Ohio laws, these rules, or verbal instructions will result in immediate termination of hunting privileges and may result in criminal prosecution. ODNR Division of Wildlife Bow Hunting Regulation will be followed. Hunters found violating CRJMTC or ODOW hunting regulations will be brought to the attention of the CRJMTC hunt coordinator. Safety violations will result in the expulsion of the hunter from any further CRJMTC bow hunts. Violation of ODOW hunting regulations will be referred to the ODOW Game Enforcement Officer for prosecution. Antlerless deer permits may be used in accordance with State regulations.

2. Bow hunts are open to employees permanently assigned to CRJMTC and one escorted guest. This includes CRJMTC staff, UTES full time staff, RTI full time staff, Readiness Center full time staff, and others authorized in accordance with CRJMTC Regulation 200-3. Guests must be U.S. citizens. Employees may bring multiple guests in over the season, but only one at a time.

3. Permits to hunt on CRJMTC will be issued by the Environmental Office for a fee of $5.00. With your hunting permit you will receive a parking pass which is to be displayed on your dashboard at all times while at CRJMTC. The permit will entitle you to unlimited hunts during the bow season, subject to availability of hunting areas each day. Hunting is not permitted on days when the training area is in use for military training, during schedule CRJMTC shotgun hunt days, or otherwise restricted by CRJMTC or Ohio law. CRJMTC Range Control may be contacted at 614-336-6041/6562 to find out when training is scheduled.

4. The season will correspond with the regular Ohio deer bow-hunting season. Hunting will be permitted Monday through Sunday during legal hunting hours pending gate access is available and training is not scheduled. Access is available only through the State Route 534 gate (East Gate).

5. Bow-hunting area assignments will be made by signing out an area each day on a first come, first serve basis. No more than one person will be in each area unless two or more hunters sign in together and want to hunt in the same area. Once a hunt area is occupied, no other hunters may go into that area.

6. Hunters must enter through the East Gate and sign in on the Bow Hunting Sign-in Form. The sign-in form is located in a binder in the CRJMTC Environmental Office Building foyer. Sign your name, your partner's name, time in, and area you will be hunting. Once all areas are filled no other hunters may go out until an area is vacated. You must also sign out and record the type of deer or turkey taken in the same binder once you have finished hunting for the day. **You must sign in and out every time you enter a bow hunt area to hunt, scout, or move a tree stand.**

7. You may drive through the Training Area and park by your hunting location. If you get stuck on a tank trail, help is not available to get you out, so do not travel on the tank trails if they are muddy and rutted. Aerial photos that show the hunting areas will be available in the binder when hunters sign in. These photos are not permitted to leave the CRJMTC.

8. Bow hunters are permitted to use tree stands in their hunting area at their own risk. Hunters must use removable cable style tree stands and must be strapped in for safety. Under no circumstances may hunters put metal of any kind (nails, screws, pegs, etc.) into any tree. Tree stands may remain in place until your permit expires at the end of the CRJMTC bow deer season. We recommend that you lock your tree stand to the tree, if left in the field. You are also required to have a tag on the tree stand that identifies you as the owner. Hunters are required to remove all tree stands from Hunt Areas 11-19 (Group 7) the Thursday prior to a Camp Ravenna Controlled Deer Hunt unless otherwise instructed by CRJMTC hunt coordinator. **All tree stands are required to be removed within a week of the end of bow season**.

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9. Hunters must check in all harvested animals in accordance with applicable Ohio Division of Wildlife requirements.

10. You are hunting in Trumbull County and may participate in the fall archery season for turkey if/when the Ohio Division of Wildlife has such a season. To do so, you must have an Ohio fall turkey permit. The state turkey regulations on season and bag limits apply. Turkey must be tagged and checked in accordance with Ohio Division of Wildlife regulations.

12. Bow hunting is only authorized in areas designated by the CRJMTC and identified in the bow hunt binder.

13. Littering will not be tolerated anywhere on the CRJMTC property. Take all waste and trash out with you. The CRJMTC property is virtually free of litter and must be kept that way.

14. There are no emergency medical services available at the CRJMTC. It's recommended that hunters carry a cellular phone in case of an emergency. Arrangements can be made to get an ambulance if necessary by contacting Range Control at 614-336-6041 or security at the East Gate 614-336-6399. The use of the CRJMTC security force and/or ambulance for emergency assistance will be on a cost reimbursable basis.

15. Violation of the CRJMTC rules or State of Ohio regulations will result in revocation of hunting privileges and possible prosecution and banishment from future participation in CRJMTC hunting, trapping, or fishing activities.

16. This program is managed by the CRJMTC Environmental Office at 614-336-4564/6569/6568. Permits may be obtained by contacting this office.

-END-

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CAMP RAVENNA JOINT MILITARY TRAINING CENTER
WATERFOWL HUNTING RULES AND PROCEDURES

1. Read and follow these instructions. Failure to comply with Ohio laws, these rules, or verbal instructions will result in immediate termination of hunting privileges and may result in criminal prosecution. ODNR Division of Wildlife and US Fish and Wildlife Waterfowl Hunting Regulations will be followed. Safety violations will result in the expulsion of the hunter from any further Camp Ravenna hunts. Violation of ODOW hunting regulations will be referred to the ODOW Wildlife Officer. All hunters must complete a Hunter Certification Statement prior to being granted access to Camp Ravenna.

2. Waterfowl hunting will be permitted at Camp Ravenna in accordance with CRJMTC Regulation 200-3, this guidance, State/Federal regulations, and installation security requirements. All hunters must be U. S. citizens. All hunters must have a state hunting license, a state waterfowl stamp, and a Federal waterfowl stamp in accordance with state and Federal law. All hunters must complete a Hunter Certification Statement prior to being granted access to the Camp Ravenna.

3. Waterfowl hunting is open to employees permanently assigned to CRJMTC and up to three escorted guests. This includes Camp Ravenna staff, UTES full time staff, RTI full time staff, Readiness Center full time staff and others authorized in accordance with CRJMTC Regulation 200-3. Employees may bring multiple guests over the season, but no more than three at a time.

4. Waterfowl permits to hunt on Camp Ravenna will be issued by the Environmental Office for a fee of $5.00. With your hunting permit, you will receive a parking pass that is to be displayed on your dashboard at all times while hunting at Camp Ravenna. The permit will entitle you to unlimited hunts during available hunt days, subject to availability of hunting areas each day. Hunt areas will be limited on days when the training area is in use for military training. Camp Ravenna Range Control (614-336-6041) should be contacted for questions regarding the training schedule.

5. Available hunt areas will be designated based on training activity. Available areas will be signed out by hunters daily on a first come, first served basis. Areas are signed out in the hunt binder when hunters sign in. Once a hunt area is occupied, no other hunters may go into that area. Waterfowl hunters may only sign out one hunt area at a time. To change hunt areas, hunters must return to the gate, check the binder, sign in the area they initially signed out and sign out a different unoccupied area.

6. No one is permitted to hunt within 150 feet of any external fence. Shots may not be directed toward external fences, into this 150 foot no hunting zone or toward buildings, vehicles, trailers, or equipment. Hunters are expected and required to hunt safely and responsibly.

7. Hunters must sign in on the waterfowl hunting sign-in form located in the Waterfowl Hunt Binder at the designated access gate(s). Sign your name, your guests name, time in, and hunt area. All hunters must be signed in by 7:00am unless otherwise approved by the Camp Ravenna Environmental Office. Once all hunt areas are filled, no other hunters may go out until an area becomes available. You will also sign out and record the number and type of waterfowl taken in the Waterfowl Hunt Binder when you leave for the day.

8. You may drive through the Training Site and park near your hunt area. If you get stuck, help is not available to get you out, so do not travel off road in muddy and wet conditions. Maps that show the hunting areas will be available in the binders when hunters sign in. These maps are NOT permitted to leave Camp Ravenna.

9. Motorized boats of any kind <u>are not</u> permitted. Row boats, canoes, rafts, hip-boots, waders, and float tubes are permitted. All occupants of boats, canoes, and rafts must have and wear personal floatation devices.

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10. Hunters can use 20, 16, 12, or 10 gauge shotguns. Only non-toxic shot may be used. Shotguns must be plugged to hold no more than three shells in the gun at one time.

11. Dogs may be used to retrieve game. The owner is responsible for controlling the dog at all times. Hunters are required to coordinate with Range Control if they need access to areas outside of their hunting area to search for lost dogs.

12. Littering will not be tolerated anywhere on the Camp Ravenna property, and especially at the hunting ponds. Take all waste and trash out with you. The CRJMTC property is virtually free of litter and must be kept that way.

13. There are no emergency medical services available at Camp Ravenna. It's recommended that hunters carry a cellular phone in case of an emergency. Arrangements can be made to get an ambulance if necessary by contacting Range Control at (614) 336-6041, the Main Gate at (330) 358-2017 or the East Gate at (614) 336-6399. The use of the Camp Ravenna contracted emergency response will be on a cost reimbursable basis.

14. Violation of Camp Ravenna rules or State of Ohio regulations will result in revocation of hunting privileges and possible prosecution and banishment from future participation in Camp Ravenna hunting, trapping, and fishing activities.

15. This program is managed by the Camp Ravenna Environmental Office at 614-336-4564/6569/6568. Permits may be obtained by contacting this office.

CAMP RAVENNA JOINT MILITARY TRAINING CENTER
SMALL GAME HUNTING RULES AND PROCEDURES

1. Read and follow these instructions. Failure to comply with Ohio laws, these rules, or verbal instructions will result in immediate termination of hunting privileges and may result in criminal prosecution. ODNR Division of Wildlife (ODOW) Small Game Hunting Regulations will be followed. Safety violations will result in the expulsion of the hunter from any further CRJMTC hunts. Violation of ODOW hunting regulations will be referred to the ODOW Wildlife Officer. All hunters must complete a Hunter Certification Statement prior to being granted access to the CRJMTC.

2. Small game hunting will be permitted at the Camp Ravenna Joint Military Training Center (CRJMTC) in accordance with CRJMTC Regulation 200-3, this guidance, State/Federal regulations, and installation security requirements. All hunters must be U. S. citizens. All hunters must have a state hunting license. All hunters must complete a Hunter Certification Statement prior to being granted access to the CRJMTC.

3. The CRJMTC Environmental Office will determine the opening day, length of season, and species that may be hunted. All of these must be within the regulations set by the State of Ohio but may be more restrictive.

4. Small game hunting is open to employees permanently assigned to CRJMTC and up to three escorted guests. This includes CRJMTC staff, UTES full time staff, RTI full time staff, Readiness Center full time staff, and others authorized in accordance with CRJMTC Regulation 200-3. Employees may bring multiple guests over the season, but no more than three at a time.

5. Season permits for small game hunting on CRJMTC will be issued by the Environmental Office for a fee of $5.00. With your hunting permit, you will receive a parking pass that is to be displayed on your dashboard at all times while hunting at CRJMTC. The permit will entitle you to unlimited hunts during available hunt days, subject to availability of hunting areas each day. Hunt areas will be limited on days when the training area is in use for military training. CRJMTC Range Control (614-336-6041/6562) should be contacted for questions regarding the training schedule.

6. Small game hunt areas are located in Portage County and hunters are permitted to participate in the State of Ohio fall turkey hunt season as/if offered by the State of Ohio. To do so, you must have a valid Ohio Fall Turkey Permit. ODOW state turkey regulations on season and bag limits apply. Hunters can use 10 gauge or smaller shotguns in accordance with ODOW hunt regulations. Muzzle loading shotguns are not permitted to be used at CRJMTC. Turkey must be tagged and checked as required by the ODOW Hunt Regulations.

7. Available hunt areas will be designated based on training activity. Available areas will be signed out by hunters daily on a first come first served basis. Areas are signed out in the hunt binder when hunters sign in. Once a hunt area is occupied, no other hunters may go into that area.

8. No one is permitted to hunt within 150 feet of any external fence. Shots may not be directed toward external fences, into this 150 foot no hunting zone or toward buildings, vehicles, trailers, or equipment. Hunters are expected and required to hunt safely and responsibly.

9. Hunters must sign in on the small game hunting sign-in form located in the Small Game Hunt Binder at the guard shack at the Main Gate. Sign your name, your guests name, time in, and hunt area. Hunting times are in accordance with state regulations or as otherwise stated/limited on your permit. Once all hunt areas are

filled, no other hunters may go out until an area is vacated. You will also sign out and record your time out and the number and type of game taken in the Small Game Hunt Binder when you leave for the day.

10. You may drive through the Training Site and park near your hunt area. If you get stuck, help is not available to get you out, so do not travel off road in muddy and wet conditions. Maps that show the hunting areas will be available in the binders when hunters sign in. These maps are NOT permitted to leave the CRJMTC.

11. Hunters can use 20, 16, 12, or 10 gauge shotguns and .22 caliber rifle for squirrel. All weapons must comply with state hunting regulations. The Training Site Commander or Base Operations Supervisor may further restrict the use of weapons.

12. Dogs may be used to hunt and retrieve game in accordance with state regulations. The owner is responsible for controlling the dog at all times. Hunters are required to coordinate with Range Control to access areas outside of their hunting area to search for lost dogs.

13. Littering will not be tolerated anywhere on the CRJMTC property. Take all waste and trash out with you. The CRJMTC property is virtually free of litter and must be kept that way.

14. There are no emergency medical services available at the CRJMTC. It's recommended that hunters carry a cellular phone in case of an emergency. Arrangements can be made to get an ambulance if necessary by contacting Camp Ravenna Range Control at (614) 336-6041. Security at Post 1 (330-358-2017) or Post 2 (614-336-6399) are secondary contacts for emergencies. The use of the CRJMTC security force and/or ambulance for emergency assistance will be on a cost reimbursable basis.

15. Violation of the CRJMTC rules or State of Ohio regulations will result in revocation of hunting privileges and possible prosecution and banishment from future participation in CRJMTC hunting, trapping, or fishing activities.

16. This program is managed by the CRJMTC Environmental Office at 614-336-4564/6569/6568. Permits may be obtained by contacting this office.

-END-

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Camp Ravenna Joint Military Training Center (CRJMTC)
Turkey Hunting Rules and Procedures

1. Read and follow these instructions. Failure to comply with Ohio laws, these rules, or verbal instructions will result in immediate termination of hunting privileges and may result in criminal prosecution. ODNR Division of Wildlife Spring Turkey Hunting Regulations will be followed. Safety violations will result in the expulsion of the hunter from any further CRJMTC hunts. Violation of ODOW hunting regulations will be referred to the ODOW Wildlife Officer for prosecution. All hunters must complete a Hunter Certification Statement prior to being granted access to CRJMTC.

2. Turkey hunts are open to employees permanently assigned to CRJMTC and up to three escorted guests. This includes CRJMTC staff, RTI full time staff, UTES full time staff, Readiness Center full time staff, and others authorized in accordance with CRJMTC Regulation 200-3. Employees may bring multiple guests over the season, but no more than three at a time. All guests must be U.S. citizens with no felony record.

3. Season permits to hunt on CRJMTC will be issued by the Environmental Office for a fee of $5.00. With your hunting permit, you will receive a parking pass that is to be displayed on your dashboard at all times while hunting at CRJMTC.

4. Individuals with a Turkey Hunting Permit and applicable State of Ohio licenses and tags may hunt turkey during both the spring and fall seasons. The season will correspond with the regular Ohio turkey hunting seasons during legal hunting hours. If the State of Ohio does not offer a spring or fall turkey hunting season, then such seasons are not offered or authorized at CRJMTC. The permit entitles you to unlimited hunts during Ohio DOW authorized turkey seasons, subject to availability of hunting areas each day.

5. Hunting will be permitted according to the schedule provided with your CRJMTC hunting permit, as posted in the sign in binder, and/or as modified by CRJMTC Range Control. Training and other mission related activities take precedence over hunting. Hunt areas will be limited on days when the training area is in use for military training. CRJMTC Range Control (614-336-6041/6562) should be contacted for questions regarding the training schedule.

6. During the fall hunting season individuals with a CRJMTC Turkey Hunting Permit and/or a Small Game Hunting Permit and applicable Ohio licenses and tags may hunt turkey on the Portage County portion of CRJMTC. Only individuals with a CRJMTC Deer Bow Hunting Permit may hunt turkey within the Trumbull County portion of CRJMTC incidental to and while deer bow hunting.

7. Available hunt areas will be designated based on training activity. Available areas will be signed out by hunters daily on a first come, first served basis. Areas are signed out in the hunt binder when hunters sign in. Once a hunt area is occupied, no other hunters may go into that area. Each hunt party is permitted to sign out two adjacent hunt areas, as available. This applies to all hunt areas except A and B Block. If you sign out A or B Block, 38B is the only adjacent hunt area you may sign out.

8. No one is permitted to hunt within 150 feet of any external fence. Shots may not be directed toward external fences, into this 150 foot no hunting zone or toward buildings, vehicles, trailers, or equipment. Hunters are expected and required to hunt safely and responsibly.

9. Hunters must sign in in either one of the Turkey Hunting Binders at the Main Gate or at the Environmental Office (when accessing through the East Gate), the Small Game Hunting binder at the Main Gate or the Deer Bow Hunting Binder at the Environmental as applicable to your permit. Sign your name, your guest's name, time in, and hunt area. Once all hunt areas are filled, no other hunters may go out until an area becomes available. You will also sign out and record the number of turkey taken from your hunt area in the appropriate binder when you leave for the day. For hunt days that end at 1200 noon, you must sign out no later than 1:00 pm. For hunt days that end at sunset, you must sign out no later than ½ hour after

sunset (per published sunrise/sunset times). Hunters must temporarily tag and check in their turkey in accordance with Ohio game laws. CRJMTC is not an authorized license outlet or game check station for turkey.

10. Hunters can use 10 gauge or smaller shotguns, long bows, or crossbows in accordance with Ohio Division of Wildlife regulations. If deer hunting is required to use a bow, then only those with a Deer Bow Hunting Permit and hunting in accordance with the CRJMTC Deer Bow Hunting requirements are so authorized. Muzzle loading shotguns are not permitted to be used at CRJMTC. The Training Site Commander or Base Operations Supervisor may further restrict the use of weapons.

11. You may drive through the Tank Table II Range and park by your hunt area. If you get stuck on a tank trail, help is not available to get you out, so do not travel on the tank trails if they are muddy and rutted. Aerial photos that show the hunting areas will be available in the binders when hunters sign in. These photos are NOT permitted to leave the CRJMTC.

12. Littering will not be tolerated anywhere on the CRJMTC property. Take all waste and trash out with you. CRJMTC property is virtually free of litter and must be kept that way.

13. There are no emergency medical services available at the CRJMTC. It's recommended that hunters carry a cellular phone in case of an emergency. Arrangements can be made to get an ambulance if necessary by contacting Range Control at Post 1 (614-336-6041/6562). The use of the CRJMTC security force and/or ambulance for emergency assistance will be on a cost reimbursable basis.

14. Violation of the CRJMTC rules or State of Ohio regulations will result in revocation of hunting privileges and possible prosecution and banishment from future participation in CRJMTC hunting, trapping, or fishing activities.

15. This program is managed by the CRJMTC Environmental Office at 614-336-4564/6569. Permits may be obtained by contacting this office.

Camp Ravenna Joint Military Training Center (CRJMTC)
Spring Youth Turkey Hunt Rules and Procedures

1. Read and follow these instructions. Failure to comply with Ohio laws, these rules, or verbal instructions given on the day of the hunt will result in immediate termination of hunting privileges. ODNR Division of Wildlife Spring Turkey Hunting Regulations will be followed. Hunters or guests found violating CRJMTC or ODOW hunting regulations will be brought to the attention of the CRJMTC hunt coordinator. Safety violations will result in the expulsion of the hunter from any further CRJMTC hunts. Violation of ODOW hunting regulations will be referred to the ODOW Wildlife Officer.

2. Hunters may hunt only one time per season at the CRJMTC.

5. As permitted by state law, 10, 12, 16, 20, 28, and .410 gauge shotguns, longbows and crossbows are permitted. No handguns, rifles, or muzzle-loading firearms may be used or brought into the facility.

6. Tree stands are not permitted on the facility. All hunting must be done from the ground. Hunters may not climb trees, enter buildings, or climb any water towers. As permitted by state law, decoys and blinds may be used. CRJMTC cannot and will not be responsible for lost, stolen, or damaged decoys or blinds left in the field.

7. Hunters should arrive at the main gate on State Route 5 between **5:15 and 5:30 a.m.** on the day of their hunt. This gate is about nine miles east of Ravenna. Helicopters are visible from the road at this gate. There is no outside lighting along the highway at the main gate, so drive carefully when turning into the base. You will be directed to building 1067 for in-processing.

8. Hunt pairs will consist of a youth hunter and non-hunting adult escort. Youth hunters must less than 18 years old and accompanied by an authorized adult non-hunting escort. An authorized adult is a parent or legal guardian 18 years or older or another adult with written permission from a parent or legal guardian to escort their child. Adult escorts must be ready to present picture identification at the gate. Hunters will need their hunting license when they go into building 1067 to register. Parking passes will be issued at building 1067 during registration. Leave your firearms in your vehicle.

9. Loaded shotguns are not permitted in vehicles under Section 2923.16 of the Ohio Revised Code. When transporting a firearm on base it must be in a case and secured out of your reach in the trunk or bed of your vehicle. Your firearm and ammunition must be transported in separate compartments and/or both must not be readily accessible to vehicle occupants.

10. All hunters must report to check-in at building 1067 upon arrival at the facility. After processing and the safety briefing, hunters will be escorted to their designated hunt parking areas. Under no circumstances may hunters stop along the way to hunt. All hunting will be from designated parking lots and assigned hunting areas. If your car breaks down, stay with the car until help arrives. Hunters are responsible for paying for towing and/or repair costs.

11. Hunters must hunt within their assigned area, and may not go out of this area. Each pair will receive a map of their assigned hunting area on the day of the hunt. Re-entry to CRJMTC once you turn in your letter permit and leave is not permitted.

12. All hunters must stop hunting at noon and return to their vehicles. **All hunters must be at building 1067 no later than 1:00 pm to sign out.** Shooting is not permitted after noon.

13. All hunters, whether successful or not, must stop back at building 1067 to sign out. All harvested turkey must be tagged and registered according to current Ohio hunting regulations.

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15. Vehicles must be parked at their assigned parking lot. Vehicles are not permitted off-road. Joy riding and sight seeing are not permitted.

16. Both hunter and escort must ride in one vehicle. Hunters must have the letter permit with them at all times while on base. Hunting and/or pursuing a wounded turkey outside of your assigned hunting area is not permitted. Neither hunters nor escorts may climb over/through or shoot through fences.

17. Hunters may not discharge their firearm within 200 feet of the installation perimeter fence, buildings, boxcars, and trailers unless they are certain they are not firing in the direction of such objects. Those hunting along the perimeter fence must be extra careful of the direction of their shots. There is a 100' to 600' No Hunting Zone around the entire perimeter fence, and a 1,200' No Hunting Zone within the Charlestown Hill area. These zones are clearly marked on the maps you will receive the day of the hunt. Shooting across roads, through fences, and from buildings, boxcars and trailers is prohibited.

18. Some roads are in poor condition. Hunters must provide suitable transportation. Vehicles must be safe and have working exhaust systems. Campers, recreational vehicles, four-wheelers, three-wheelers, or other recreational vehicles are not permitted.

19. In the event of an emergency, you will be signaled to return to your parking area with repeated horn blasts. If you hear such blasts, return to your designated parking area immediately. A hunter aware of an injury or other emergency shall immediately go to building 1067 and report the incident. Do not call 911 for assistance. Call Range Control at 614-336-6041 and they will contact emergency response.

20. Upon entrance and exit from the facility, all personnel and vehicles are subject to search for and seizure of prohibited items. The following items are not permitted on the installation. Do not bring them with you. The government is not responsible for lost or stolen prohibited items that are seized.

a) handguns, rifles, black powder guns of any kind
b) alcoholic beverages, narcotics, or illegal drugs of any kind
c) tree stands

21. Smoking is permitted only in the parking lot of building 1067 and your vehicle. Cigarette butts may not be thrown on the ground. Hunters must take all litter with them when they leave. Littering will not be permitted anywhere on the installation. Portable restroom facilities may be available at building 1067.

22. You are not permitted to remove anything from CRJMTC except for legally harvested turkey. Do not remove bottles, antlers, firewood, or any other artifact or object found in the field.

23. Only turkey are legal during this hunt. Do not shoot any other animal or bird.

Camp Ravenna Joint Military Training Center (CRJMTC)
Trapping Rules and Procedures

1. Trapping will be permitted at Camp Ravenna Joint Military Training Center (CRJMTC) in accordance with this guidance, state/Federal regulations, and installation security requirements. Trappers will be selected to participate by CRJMTC. The main purpose of the CRJMTC Trapping Program is to control nuisance species and help maintain ecological balance.

2. All Ohio trapping laws will apply unless more restrictive bag limits and seasons are set by CRJMTC. Trappers may trap species in accordance with state trapping regulations during the approved CRJMTC trapping season as designated on their permit.

3. Trappers will trap in pairs in one vehicle per pair. All trappers are required to attend a pre-season in-briefing, given at CRJMTC, prior to having access to trap at the training site. The trapping rules and regulations will be discussed at the briefing.

4. Each trapper pair will be given one map showing their trapping area. Trapping may only be done in the location indicated on the map. Trappers may not trap in areas not assigned to them. Trappers must turn this map into CRJMTC at the end of the season.

5. When beaver trapping is permitted trappers will be assigned specific trapping locations and specific goals to eliminate the beaver or thin the population. Trappers may not exceed the maximum take specified per area. Every effort must be made to eliminate the beaver in those areas so indicated. Trappers must report to CRJMTC Environmental Office if they are not able to eliminate the beaver populations in designated areas.

6. Each trapper is required to check their traps daily and to submit a summary of their trapping results to CRJMTC at the end of the season. Trappers must list all species they trapped and number of individuals caught.

7. Access to CRJMTC will be provided through the Main Gate off of State Route 5 or the East Gate off of State Route 534 depending upon which trapping area they have been assigned. Access times will be in accordance with the gate schedule.

8. Trappers will be given approved access routes to and from their trapping areas. These routes are the only roads they are permitted to be on.

9. Trappers are permitted to have a .22 cal pistol or rifle with them while on CRJMTC property. This firearm may only be used to dispatch animals in traps. Shooting or hunting animals not caught in a trap is prohibited.

10. CRJMTC is a Federal installation, but the State of Ohio has concurrent jurisdiction and has enforcement and prosecution authority for state game laws. Violators of these laws are subject to arrest and prosecution by state wildlife authorities.

11. Trappers and their vehicles are subject to search and seizure of prohibited items upon entering

CRJMTC and at any time while at CRJMTC. The following items are not permitted on the installation. Do not bring them with you!!!

a. Alcoholic beverages
b. Narcotics or any other illegal drugs
c. Firearms/weapons other than indicated above

12. In the event of snow, the roads will not be plowed. Trappers must have a vehicle capable of getting through snow covered roads. CRJMTC will not provide assistance to broken down vehicles. It's recommended that trappers carry a cellular phone in case of an emergency.

13. Snow mobiles, 4-wheelers or other all-terrain vehicles may be permitted on a case by case basis.

14. Trappers are encouraged to trap with their partner when setting and checking their traps. There are no emergency services at CRJMTC. If emergency services are needed, the local fire department will be called and the trapper is responsible for pay the cost. All trappers must sign a certification and indemnity form.

15. Access Procedure:

a. Trappers will go through the installation orientation, be shown their trapping areas;
b. Trappers will arrive at the designated gate and will identify themselves with picture id, trapping permit, and parking pass;
c. Trappers will proceed to their designated trapping areas and set/check traps;
d. After setting/checking their traps, trappers will proceed back to designated gate inform the guards they are leaving and leave the training site.

16. Violation of CRJMTC rules or State of Ohio regulations will result in revocation of trapping privileges and possible banishment from future participation in CRJMTC hunting, trapping, and fishing activities.

17. There are no emergency medical services available at CRJMTC. It's recommended that hunters carry a cellular phone in case of an emergency. Arrangements can be made to get an ambulance if necessary by contacting Range Control at 614-336-6041. The use of CRJMTC security force and/or ambulance for emergency assistance will be on a cost reimbursable basis.

18. This program is managed by the CRJMTC Environmental Office at 614-336-4564/6569/6568. Permits may be obtained by contacting this office.

Camp Ravenna Joint Military Training Center (CRJMTC)
Employee Fishing Rules and Procedure

1. Read and follow these instructions. Failure to comply with Ohio laws, these rules, or verbal instructions will result in immediate termination of hunting privileges and may result in criminal prosecution. ODNR Division of Wildlife (ODOW) Fishing Regulations will be followed. Safety violations will result in the expulsion of the fisherman from any further CRJMTC fishing and/or hunting. Violation of ODOW fishing regulations will be referred to the ODOW Wildlife Officer. All fishermen must complete a Hunter Certification Statement prior to being granted access to the CRJMTC.

2. Fishing will be permitted at the Camp Ravenna Joint Military Training Center (CRJMTC) in accordance with CRJMTC Regulation 200-3, this guidance, State/Federal regulations, and installation security requirements. All fishermen must be U. S. citizens. All fishermen must have a state of Ohio fishing license and a CRJMTC issued Fishing Permit. All fishermen must attend an in brief and complete a CRJMTC Hunter, Fisher, Trapper Certification Form. There is a $5.00 annual administration fee charged for employee permits.

3. Employee fishing is open to employees permanently assigned to CRJMTC and up to four (4) escorted guests. This includes CRJMTC staff, UTES full time staff, RTI full time staff, Readiness Center full time staff, and others authorized in accordance with CRJMTC Regulation 200-3. Employees may bring multiple guests over the season, but no more than four (4) at a time.

4. Authorized employee fishing locations include most ponds throughout CRJMTC unless specifically restricted by the CRJMTC Environmental Office. Fishing is not permitted at WW III Ponds, the Load Line Ponds, Mack's Pond, and Erie Burning Grounds.

5. Fishing is **from the shore only** in Big and Little Cobb's Ponds, Kelly's Pond, and Criggy's Pond.

6. Harvest limits are specified with the permit and must be followed. Regular State of Ohio fishing creel limits are applicable in all ponds with limits not specifically listed. Fishing is catch and release only in Big and Little Cobb's Ponds, Kelly's Pond, and Criggy's Pond.

7. Wading is not permitted in any of the former load line settling ponds (LL#4 Pond, Criggy's Pond, Cobb's Ponds, Kelly's Pond).

8. All fishermen must stop at the Main Gate or East Gate and show the security guard a valid permit before they will be granted access to CRJMTC. Fishermen will sign in on the appropriate fishing roster. Security may ask to see photo identification and may search vehicles at their discretion.

9. Private vehicles are permitted on CRJMTC to access to fishing ponds. Private vehicles are only authorized to travel designated routes to fishing locations. Private vehicles are not permitted in any other areas. Vehicles and access are not permitted in any training area actively being used for training.

10. Existing safety and security requirements are applicable. No one may interfere with training or other base operations. Vehicles and persons are subject to search and seizure of

prohibited items. If you are found in violation of any installation or fishing rules, you will be removed from the training site. Alcohol, drugs, explosives and firearms are not permitted on base.

11. Littering is NOT PERMITTED. All trash must be taken off base. DO NOT put trash in cans at the ponds!!

12. The only live bait permitted is locally purchased earthworms, night crawlers, grasshoppers, and crickets. Minnows, crayfish, tadpoles, and frogs may **not** be brought onto the installation. You may NOT capture and use any baitfish or other live bait at CRJMTC.

13. Fishing hours are in accordance with the Main Gate and East Gate schedules, but no earlier than 0700 hours and no later than ½ hour before sunset. All persons on base fishing must be off post by sunset.

14. Motorized boats of any kind are not permitted. Small row boats, canoes, one-man float boats, hip-boots, waders, and float tubes are permitted in all ponds except for Cobb's Ponds, Kelly's Pond, and Criggy's Pond and those listed as off limits in item 4 above. All privately owned boats and canoes must be licensed IAW Ohio law and occupants must have life vest available.

15. There are no emergency medical services available at CRJMTC. It's recommended that fishermen carry a cellular phone in case of an emergency. Arrangements can be made to get an ambulance if necessary by contacting Range Control at 614-336-6041/6562, Main Gate (330-358-2017) or East Gate (614-336-6399). The use of emergency response will be on a cost reimbursable basis.

16. The CRJMTC Environmental Office at (614) 336-4564/6569/6568 administers the fishing program. Permits may be obtained by contacting this office.

Camp Ravenna Joint Military Training Center (CRJMTC)
Military Trainee Fishing Rules and Procedure

1. Read and follow these instructions. Failure to comply with Ohio laws, these rules, or verbal instructions will result in immediate termination of hunting privileges and may result in criminal prosecution. ODNR Division of Wildlife (ODOW) Fishing Regulations will be followed. Safety violations will result in the expulsion of the fisherman from any further CRJMTC fishing and/or hunting. Violation of ODOW fishing regulations will be referred to the ODOW Wildlife Officer. All fishermen must complete a Hunter Certification Statement prior to being granted access to the CRJMTC.

2. Military Trainee fishing will be permitted at the Camp Ravenna Joint Military Training Center (CRJMTC) for off-duty active duty and reserves component military personnel while training at Camp Ravenna in accordance with CRJMTC Regulation 200-3, this guidance, State/Federal regulations, and installation security requirements. Fishing is only permitted outside of official duty hours.

3. All fishermen must have a state of Ohio fishing license in accordance with state law and a CRJMTC issued Fishing Permit or be listed on a CRJMTC Military Personnel Fishing Access Roster. There is no charge for a Military Trainee Fishing Permit.

4. All fishermen must attend an in brief and complete a CRJMTC Hunter, Fisher, Trapper Certification Form.

5. The CRJMTC Environmental Office at (614) 336-4564/6569/6568 administers the fishing program but military trainees must go through their Chain of Command, Camp Ravenna Range Control and/or the RTI, whichever is applicable to obtain permits.
   - The Mayor Cell or Unit Command must submit a list of those who want to fish to Camp Ravenna Range Control or students enrolled in an RTI course will inform their instructor of their desire to fish.
   - The RTI instructor or Camp Ravenna Range Control will administer a short in-brief and provide Certification Forms. Range Control may provide the brief and forms to the Command to administer.
   - Completed Certification Forms and a list of soldiers with training dates will be submitted to the Environmental Office.
   - The Environmental Office will then issue individual Military Trainee Fishing Permits or a Military Trainee Fishing Access Roster to facilitate access.

6. All fishermen must stop at the Main Gate or East Gate and show the security guard a valid permit before they will be granted access to CRJMTC. Those on an access roster will be confirmed by Security. Security may ask to see photo identification and may search vehicles at their discretion.

7. Private vehicles are permitted on CRJMTC to access to fishing ponds. Private vehicles are only authorized to travel designated routes to fishing locations. Private vehicles are not permitted in any other areas. Vehicles and access are not permitted in any training area actively being used for training.

8. Existing safety and security requirements are applicable. No one may interfere with training or other base operations. Vehicles and persons are subject to search and seizure of

prohibited items. If you are found in violation of any installation or fishing rules, you will be removed from the training site. Alcohol, drugs, explosives and firearms are not permitted on base.

9. Fishing is permitted at Upper and Lower Cobb's Ponds only. Fishermen are NOT permitted to be anywhere else on base. You are only permitted to be at Cobb's Pond.

10. You are not permitted to keep any fish. All fish caught must be released.

11. No one is permitted in the water. Wading is not permitted. Only shore fishing is permitted.

12. Littering is NOT PERMITTED. All trash must be taken off base. DO NOT put trash in cans at the ponds!!

13. The only live bait permitted is locally purchased earthworms, night crawlers, grasshoppers, and crickets. Minnows, crayfish, tadpoles, and frogs may **not** be brought onto the installation. You may NOT capture and use any baitfish or other live bait at CRJMTC.

14. Fishing hours are in accordance with the Main Gate schedule, but no earlier than 0700 hours and no later than ½ hour before sunset. All persons on base fishing must be off post by sunset.

15. There are no emergency medical services available at CRJMTC. It's recommended that fishermen carry a cellular phone in case of an emergency. Arrangements can be made to get an ambulance if necessary by contacting Range Control at 614-336-6041/6562. The use of emergency response will be on a cost reimbursable basis.

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APPENDIX F
VEGETATION CONTROL PLAN

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CAMP RAVENNA JOINT MILITARY TRAINING CENTER
VEGETATION CONTROL PLAN

23 DECEMBER 2013

I. INTRODUCTION

This vegetation control plan describes the approved vegetation control methods used at the Camp Ravenna Joint Military Training Center (CRJMTC – Camp Ravenna) to manage vegetation. It is updated from time to time to reflect additions and modifications. The general control methodologies are expected to remain the same over time. Changes are expected in regard to the locations they are implemented as missions and priorities change.

The intention is for this plan to be useable by Camp Ravenna staff assigned the task of mowing or other vegetation control. For that reason, the plan is arranged by control method for quick reference.

Vegetation control areas are shown on the Camp Ravenna Mowing Plan Map, the Camp Ravenna Herbicide Vegetation Control Map, and the Camp Ravenna Habitat Management Areas Map.

In general, mowing should not be done when the ground is so saturated that the soil is rutted from the tractor. Mowing should only be done in wet soil conditions for an emergency or if part of an approved construction project that will disturb the soil anyway.

Always check with the Camp Ravenna Environmental Office if you are unsure about a particular vegetation control or mowing operation (614-336-4564/6568).

II. MOWING

A. Restricted Mowing Areas

These are areas that may not be mowed between 15 April and 15 August each year. These are areas that need to be set aside for late summer or fall mowing or for mowing in late winter or early spring before the ground thaws. Never mow these areas during the restricted time without first coordinating and getting approval from the Environmental Office.

1. Perimeter Fence - Expanse Area
2. Power Lines Outside of Unrestricted Areas – Active and Inactive Lines, including abandoned sewer lines, abandoned water lines, abandoned steam lines.
3. All Tornado Shelter and Inactive Igloos – Except Igloos with Target Lifters
4. TVMA – Except Target Lifters
5. MMPTR (Tank Table II) – Except Range Tower/Buildings, BP's, Target Lifters
6. Bore Sight Lane North of Helipads on East Side
7. MPMG Range Impact Area
8. YAK Drop Zone - Portions Where Delayed Mowing Does Not Impact Mission
9. Field East of the Rappel Tower
10. Ramsdell Landfill
11. Old Administration Area Fence Line
12. Open Demolition Areas #1 and #2
13. Hunting Access Lanes
14. Primary Grassland and Young Forest Habitat Management Areas (see Habitat Management Areas Map)
15. All Other Areas Not Listed as Unrestricted.

B. Unrestricted Mowing Areas

These are areas that may be mowed any time of the year. Such areas include improved grounds which are regularly mowed during the growing season to maintain a well groomed appearance as well some semi-improved and unimproved areas that must be mowed as needed to support mission needs.

1. Cantonment Area 1 (see Mowing Plan Map)
2. Cantonment Area 2 (see Mowing Plan Map)
3. Cantonment Area 3 (see Mowing Plan Map)
4. Tactical Training Base (TTB), Rappel Tower, Leadership Reaction Course
5. All Active Roads, Roadsides, and Ditches
6. All Training Area Access/Maneuver Trails
7. Around all Parking Areas, Motor Pools, Fuel Points, Wash Racks
8. Perimeter Fence - One pass on either side of fence
9. Internal Fences Trumbull County Side and TTB Portage County Side
10. Slagle Road Drop Z one - Mowed by AFRES
11. YAK Drop Zone - NW and SE Portions
12. MPMG Range ROCA and Line of Sight to Targets
13. All Active Ranges Except the MPMG Impact Area and MMPTR (Tank Table II)
14. Shoot House
15. Buildings 812, 813, LL#5 Parking (across from 813), and NBC Training Chamber
16. Depot Administration Area
17. Active Training Areas – Designated Areas (see Mowing Plan Map)
18. Groups 3, 4, 6, 7 and 8 - Access Lanes and Around Buildings
19. C-Block ASP, CE Storage and Active Igloos
20. Helipads and Designated Grass Landing Zones
21. Cobb's Pond Picnic Area
22. All Pond Earthen Dams and Access Roads

III. BRUSH CUTTING/CLEARING

This is a vegetation control technique that uses a grinder, drum shredder, hydro-axe, or heavy duty brush hog to grind up thick woody brush and small trees that have taken over an area that was previously grassland or open field. Brush cutting is often used to restore grasslands, maintain young forest habitat and as site preparation for construction projects. Since brush cutting and clearing drastically modify habitat and will more than likely require some type of environmental review. All such operations must be coordinated with and approved by
Camp Ravenna Environmental before commencing.

IV. CONTROLLED BURNING

Controlled burning has limited applications at Camp Ravenna because our burn windows in the spring and fall are very narrow and there are only a few areas where the vegetation is appropriate to support a fire. Controlled burning is a viable option for grassland management and has some forest management applications. Burning may only be done by trained personnel in accordance with the Camp Ravenna Integrated Wildland Fire Management Plan (IWFMP). An Open Burning Permit from the Ohio EPA Akron Regional Air Quality Office is required as well as NEPA review and approval by Camp Ravenna Environmental.

V. HERBICIDE APPLICATIONS

A. General Information

Herbicides are used in situations where mowing is not able to meet the vegetation control needs. Herbicide applications are done both by in-house staff and via contracted applications. All applications are done in accordance with the OHARNG Installation Pest Management Plan. Applications are done by certified applicators. Camp Ravenna Environmental is responsible for oversight of all pesticide application and program management.

All herbicide application in, over or near waters of the state are regulated by the Federal Water Pollution Control Act, as amended (33 USC 1251 et. Seq) and the Ohio Water Pollution Control Act (ORC Chapter 6111). The Ohio EPA has issued a General National Pollution Discharge Elimination System (NPDES) Permit that authorizes such herbicide applications within the conditions set forth in the permit. The regulations and permit particularly impact applications to roadside ditches but have the potential to impact all herbicide applications done at Camp Ravenna depending upon the nature of the application and the application site. All herbicide applications for the control of vegetation at Camp Ravenna must be reviewed by the ENV office to ensure compliance with the current Ohio EPA General NDES Permit. Application not in compliance with the permit conditions and threshold limits will generally not be conducted. If such an application cannot be avoided, an individual NPDES permit will be obtained by the application proponent.

B. In-House Applications

In-house applications are done for minor control needs, emergency control needs, when operational flexibility that is not possible with contracting is needed, and for areas missed by contractors. All herbicide applications are reviewed and coordinated with Camp Ravenna Environmental prior to initiating. Application reports are completed by applicators and submitted to Environmental within one week of application.

C. Contracted Applications

The majority of herbicide applications are done by contractor because contractors have the equipment and expertise with various herbicides to deliver vegetation control in a timely and effective manner. Contracted applications include the following locations and control requirements.

1. **Fence Lines:** Maintain a three-foot, vegetation clear zone directly beneath the fence fabric, as well as a ten-foot, woody vegetation free zone to either side of the designated fence line. All the specified fence-line must be treated under the fabric. Woody vegetation treatment adjacent to the fence fabric is required where woody vegetation is present. Woody vegetation from seedlings up to 2 inches in diameter at 4.5 feet must be treated in the 10-foot area on each side of the fence fabric as encountered. This can be done as a spot treatment, a broadcast spray treatment, or a cut stump treatment as appropriate. Most of the fence clear zones are free of woody vegetation but it is re-establishing in some areas and must be treated as encountered.

Fence Line Herbicide Application Locations				
	Location	**Approx. Linear Feet**	**Woody Brush**	**Comments**
1	CRJMTC Perimeter Fence	157,900	minor	Mostly clear some woody brush in areas not mowed for the last several years.
2	Training Area 58 Perimeter Fence	1,600	minor	Mostly clear some woody brush in areas not mowed for the last several years.
3	CRJMTC internal Cantonment Area 3 including Armory Motor Pool and sewage lift station	2,100	minor	Easy access, new fence.
4	State Maintenance Area Fence (East side)	1600	minor	May be a few spots of brush.
5	Tank Table II Range Tower Fence	500	none	Easy access, new fence.
6	Armor Training Center (ATC)	1,200	none	New fence. Kill directly under fence fabric on slope and avoid wetland.
7	Fuel Point Fence (East side)	880	none	Easy access, new fence.
8	UTES Compound Fence	1500	none	Easy access, new fence.
9	UTES Fenced Motor Pool	900	none	Easy access. Treat entire fence line.
10	Old Administration Area Fence (Cantonment Area 1)	8,400	minor	Both sides of fence mowed
11	TTB Perimeter Fence	6,200	Heavy along south fence line.	Clear woody brush and small saplings along east fence line. Kill directly under fence fabric for remaining fence line.
12	Rappel Tower Fence, LRC	400	none	Easy access, new fence
13	Shoot House Fence	400	none	Easy access, new fence
	Total	**183,580**		

2. **Active Power Lines:** There is approximately 17.35 miles of active above ground power-line right-of-way to be treated. The width varies from 120 feet to 30 feet. The estimated total acreage to be treated is less than 120 acres. The treatment area includes all the active power line including the power line in Cantonment Area 1 up to Fuze and Booster Road, to the Load Line 9 to the water tower, up Detonator Spur to the Shoot House, to Newton Falls Road west to the ASP; the power line that enters at Post 21 (South Gate) through Group 6, north through Load Line 12, east to Load Line 2 and south to Group 6; the Power line that enters at Post 13 (North Gate) south into the TTB and west along Smalley Road to the Range Complex and SW to the MPMG Range; and the power line that enters at and services the State Maintenance Area (Cantonment Area 3). Power lines include service lines and the connections to the buildings. There is an additional 1.4 lines of buried power lines that are maintained by mowing and so do not require herbicide treatment. See the Camp Ravenna Herbicide Vegetation Control Map for the location of active above ground power line rights-of-way.

Maintain a three-foot, vegetation clear zone surrounding all power-line mowing obstructions in designated areas, and control woody vegetation within the power-line right-of-way (including ditch-line vegetation as encountered). Mowing obstructions include poles, guy wires, signs, transformers, transformer banks/fences, and all other obstacles within the right-of-way. Control woody vegetation within the right-of-way. The woody vegetation control within the right-of-way will require a spot treatment, a broadcast spray treatment, or a cut stump treatment as appropriate - usually in areas where mower access is difficult. The entire right-of-way area does not require treatment for woody vegetation. Woody vegetation growing within the right-of-way and encroaching on the right-of-way from the sides that is inhibiting mowing will be treated as encountered. The primary target is woody brush, seedling, and saplings up to six inches in diameter measured at 4.5 feet from the ground that are encroaching from the forested edges of the right-of-way. Areas within the right-of-way dominated with smaller seedlings and advanced regeneration of woody species will also be treated. This will require a broadcast foliar application where encountered or cutting and treatment of cut areas.

3. **Active Railroad Tracks:** The area to be treated includes the railroad track from Smalley Road south through the rail-gate to the CSX mainline. This includes the Classification Yard, the Wye, the Spur to Load Line 1 Road, the tracks leading to the Engine Repair Building, tracks two target berms, access roads to the Classification Yard and target berms, and the sidings and abutments of the Railroad Bridge on both sides of State Route 5. Create a vegetation free zone within the Railroad Track-bed (ballast) and control woody vegetation to the backside of the ditches on designated railroad tracks. Treat the railroad track on the target berms in Training Area C to control all vegetation within the track ballast and woody vegetation within six feet of either side of the rail ballast. There are approximately 11.1 miles of track (19 track wide Classification Yard, access tracks, turn around track, and railroad track target berms). The railroad track treatment area is approximately 30 acres. See the Camp Ravenna Herbicide Vegetation Control Map for the location of active railroad track locations.

   Treat to control woody vegetation under the Railroad Bridge and 25 feet to either side of the track and bridge from Post 18 to the CSX main line. Treatment may require cut stump treatment, basal bark treatment, and/or foliar application to provide adequate control.
   to control vegetation on the Classification Yard south access road and the access road to the target berms (including the road on berm 2.). These gravel roads and must be vegetation free for the width of the road surface (12' in the Classification yard and 8' to 10' at the berm site) and woody vegetation free for 8 feet on either side of the road. The Classification Yard access road is approximately 24 miles long. The berm access road is approximately 0.37 miles long. The road on the berm is approximately 0.26 miles long.

4. **Buildings and Miscellaneous Areas:** Maintain a three-foot (unless a smaller zone is specified), vegetation clear zone around buildings and other facilities in designated areas. Also treat and obtain vegetation free gravel areas in locations identified below. There is approximately 764,678 (approx. 18 acres) square feet of total surface area to treat. A large portion of this area is treat only as needed - if vegetation is present. Woody vegetation growing adjacent to buildings, docks, ramps, and other designated areas to be treated must be controlled within the three-foot treatment zone (unless a smaller zone is specified). Treatment of woody vegetation may require cut stump treatment, basal bark treatment, and/or foliar application to provide adequate control.

The table below lists the buildings and areas to be treated. New areas may be added as new facilities are constructed and/or old facilities are needed for a training mission.

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
1	East Gate Guard Shack	1	20' x 30'	124'	336 sq ft	336
2	CRJMTC HQ Building, EN Building, Parking Lot, and Sewer Tank Area	1	250' x 400'	1324'	Around building as needed, all vegetation in parking lot & tank area	100,000
3	Readiness Center (Armory) – Motor Pool, Curbs, Sidewalks	1			Entire Area as needed	60,000
4	Shower Trailers	2			300 sq ft	600
5	Buckey Village	10	15' x 40'	1,000'	treat as needed	3,000
6	Shower Trailer Parking Area	1			Entire Area as needed + 1 foot beyond	1,200
7	UTES Tank Compound	1	200' x 200'	824'	Entire Area as needed	40,000
8	UTES Tank Compound Security Area	1	40' x 50'	224'	Entire Area as needed	200
9	UTES POV Parking Area	1			Entire Area as needed + 1 foot beyond	8,000
10	UTES Gravel & Concrete Area around Shop	1			Entire Area as needed	86,500
11	UTES North Bldg.	1	40' x 140'	232' (3 sides)	treat as needed	696
12	UTES Hazardous Waste Storage Building and hazmat storage	1	20' x 60'	160'	treat as needed	480
13	CRJMTC Above Ground Fuel Tank	1	40' x 400'	880'	Entire Area as needed inside fence	1,600
14	Wash Rack	1			treat entire gravle area as needed and building perimeters	45,000
15	AAR Bldg. Simulation Center Area	1	36' x 36'	144'	treat as needed	432
16	Simulation Bldg.	2	48' x 160'	512' (3 sides)	treat as needed	1,536
17	Simulation Bldg.	1	50' x 50'	200'	treat as needed	600

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
18	East Artillery Pad Perimeter	1	500' x 800'	2,624'	Surface Encroachment + 3' beyond pad	20,000
19	West Artillery Pad Perimeter	1	260' x 600'	1,700'	Surface Encroachment + 3' beyond pad	17,000
20	DOCS Refueling Point Simulator Area	1	16' x 50'	132	treat as needed	396
21	Load Line 2 Road DOCS Refuel Point	1		1,500	Treat entire gravel area	115,265
22	North Dig Site DOCS	1	16' x 50'	132	treat as needed	396
23	Misc DOCS	2	16' x 50'	264	treat as needed, location may vary	792
24	Helicopter Pad Gravel Drive	1	15' x 50'	130'	Entire Area as needed	750
25	Armor Training Center Gravel inside fence	1			Entire Area as needed	22,500
26	CRJMTC Equip Storage Bldg	1	60' x 90'	300'	treat as needed	900
27	CRJMTC Equip Storage Bldg Parking Lot	3	60' x 40',	208',	Entire Area as needed + 1 feet beyond	29,572
28			40' x 90',	268' ,		
29			150' x 150'	608'		
30	Armor Training Center Parking Lot	1			Entire Area as needed	21,000
31	CRJMTC Trailer	1	16' x 60'	176'	528 sq ft	528
32	CRJMTC Trailer Parking Area	1	60' x 30'	180'	1,800 sq ft	1,800
33	CRJMTC Maintenance Shed Gravel Lot	1	60' x 80'	288'	Entire Area as needed + 1 foot beyond	4,800
34	CRJMTC Maintenance Shed	1	24' x 36'	144'	396 sq ft	396
35	Wash Rack	1	100' x 100'	424'	618 sq ft	618
36	Wash Rack Storage Shed	1	16' x 16'	72'	68 sq ft, 1 foot beyond foundation	68
37	Wash Rack Pump House	1	25' x 25'	108'	104 sq ft, 1 foot beyond foundation	104
38	State Maintenance Connex	1	8' x 40'	104'	100 sq ft, 1 foot beyond foundation	100
39	State Maintenance Garage	1	60' x 120'	252'	756 sq ft	756
41	State Maintenance FE Bldg.	1	50' x 80'	192'	576 sq ft	576
42			(3 Sides)			

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
43	State Maintenance Garage Concrete Pad	1	25' x 120'	290'	Entire Area as needed (cracks in pad, edges)	3,000
44	State Maintenance FE Bldg Concrete Pad	1	25' x 50'	150'	Entire Area as needed (cracks in pad, edges)	1,250
45	State Maintenance		10' x 15',		142 sq ft, 1 foot	
46	Storage Sheds	3	2 (10' x 10')	154'	beyond foundation	142
47	State Maintenance Complex Gravel Lot	1			Entire area as needed + 3 feet beyond	72,000
48	State Maintenance AST	2	10' x 10'	80'	80 sq ft, 1 foot beyond tank	80
49	CRJMTC Hazardous Waste Storage Building	1	20' x 20'	88'	84 sq ft, 1 foot beyond foundation	84
50	Tank Table II Range - Tank Firing Positions	2	90' x 90'	N/A	All veg. on gravel area, woody veg. on balance	16,200
51	Tank Table II Range – Tank Firing Position AAR Bldg	1	30' x 30'	144'	396 sq ft	396
52	Tank Table II Range – Range Tower	1	20' x 20'	104'	286 sq ft	286
53	Tank Table II Range - Snack Bldg. at Range Tower	1	8' x 10'	60'	72 sq ft	72
54	Tank Table II Range – Range Control Bldg.	1	60' x 30'	204'	576 sq ft	576
55	Tank Table II Range - Transformer at Range Tower	1	8' x 8'	56'	120 sq ft	120
56	Tank Table II Range – AAR Bldg at Bore Sight Pad	1	30' x 60'	204'	576 sq ft	576
57	Tank Table II Range – Target Sheds	2	20' x 25'	124'	712 sq ft	712
58	Training Area 60 Storage Yard	1	120' x 225'	690'	Entire area as needed + 1 ft beyond	27,000
59	Conley Training Area	1			Treat poinson ivy as needed	50,000
60	McKibben Road Class IV Storage Yard	1	200' x 200'	800'	Entire area as needed + 1 foot beyond	40,000

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
61	CRJMTC Barracks 1, Sidewalks, Curbs, Parking	1	100' x 200'	624'	1, 872 sq ft, cracks in curbs, sidewalks, parking lot	2,000
62	CRJMTC Barracks 2, Sidewalks, Curbs, Parking	1	160' x 50'	444'	1,296 sq ft, cracks in curbs, sidewalks, parking lot	1,500
63	CRJMTC Barracks 3, Sidewalks, Curbs, Parking	1	160' x 50'	444'	1,296 sq ft, cracks in curbs, sidewalks, parking lot	1,500
64	RTI Trailers, Parking	2	30' x 50'	336'	328 sq ft, 1 foot beyond skirting, gravel lot as needed	750
65	Bldg. 812, off of Remalia Rd.	1	51' x 202'	1,003'	2,006 sq ft, 2 ft beyond + gravel area north side of building	42,000
66			2(12' x 112')			
67	Bldg 813, Fuze and Booster Rd.	1	51' x 202'	506'	1,012', 3 ft beyond	3,036
68	Bldg 813 parking LL 5	1		1,500'	Treat as need to keep veg free.	122,000
69	TTB (Group 2) Bldgs.	17	62' x 219'	562'	1,718' sq ft, include misc small bldgs and sewer lift stations in treatment.	29,206
70	TTB Gravel Lots	11+		10,700'	Treat as needed to maintain ved free	455,100
71	TTB Clamshell North + Parking	1	135' x 85'	440' perimeter	29,000 sq ft gravel + bldg perimeter	30,320
72	TTB Clamshell South + Parking	1	85' x 55'	280' perimeter	11,000 sq ft gravel + bldg perimeter	11,840
73	TTB Grenade Qualification Range Path, Targets, Firing Positions	7			Treat as needed to maintain veg free	3,200
74	TTB Poison Ivy				Open area throughout	3,800,000
75	Group 3 Bldgs.	21	48' x 110'	316'	980' sq ft	20,580
76	Group 4 Bldgs.	26	29' x 38'	154'	494' sq ft	12,844
77	Group 6, 800 Series Bldgs.	7	126'x 403'	1,058'	3,206 sq ft	22,442
78	Group 6, 800 Series Bldgs.	1	55' x 100'	310'	962 sq ft	962
79	Group 6, 800 Series Bldgs.	1	51' x 202'	1,003'	3,206 sq ft	3,206
80			2(12' x 112')			

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
81	Group 6 aprons and parking				Gravel and parking throughout	231,000
82	Group 8 Bldgs.	21	504' x 50'	1,108'	3,356 sq ft	70,476
83	20-X-6 (South Patrol Road)	1	98' x 224'	644'	1,964 sq ft	1,964
84	Standard Magazines 1-8	8	62' x 219'	562'	1,718 sq ft	13,744
85	Bldg. 813, Fuze & Booster Road	1	100' x 400'	1,024'	3,036 sq ft	3,036
86	NBC Chamber, Fuze & Booster Road	1	30' x 45'	178'	486 sq ft	486
87	NBC Chamber Parking Lot	1	170' x 80'	524'	Entire area as needed	31,304
88	Shoot House	6		1,100'	Bldg perimeter + 20,600 gravel	23,900
89	Depot Area – Bldg IW1-IW3	3	81' x 201'	564'	1,724 sq ft	5,172
90	Depot Area – Bldg U14	1	76' x 516'	1,184'	3,584 sq ft	3,584
91	Depot Area – Bldgs. U7-U8	2	59' x 283'	684'	2,084 sq ft	4,168
92	Depot Area – Open Storage Sheds T-2601 and T-2602	2	30' x 307'		Entire Area in Shed as needed + 3' beyond	11,300
93	Depot Area – Bldg U-4	1	74' x 162'	472'	1,416 sq ft	1,416
94	Depot Area – Bldg U-5	1	57' x 102'	318'	954 sq ft	954
95	Depot Area – Building Collapse Simulator	1	250' x 100'		Encroachment + 1 foot from base of simulator	25,000
96	Depot Area Water Hydrant	1		200'	treat perimeter as needed	600
97	Depot Area gravel, parking	1			treat as needed	107,800
98	Portable Toilets	80	4' x 4'	1, 920'	1,600 sq ft, 1 foot beyond	1,600
99	Depot Area Training Village	1			Treat building perimeters. Keep parking and gravel areas veg free. Treat poison ivy as encountered.	100,000
100	Training Area 19 RTI MP Area to include gravel parking	1			Keep parking area veg free. Spray poinson ivy as needed and vegetation in concertina wire.	100,000

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
101	Gravel Pads north of A and B Blocks	6			Treat to maintain veg free.	240,000
102	Gravel Pads north of D and E Blocks	5			Treat to maintain veg free.	186,500
103	Gravel Pad west of Rt 80, south side of McComrick Rd.	1			Treat to maintain veg free.	44,000
104	Gravel Pads on Greenleaf Rd.	8			Treat to maintain veg free.	90,000
105	Pad at west end of NACA Strip - TA-20	1			Treat to maintain veg free gravel and poison ivy free.	20,000
106	Training Area 21	1			Treat gravel to maintain veg free. Treat poison ivy as encountered	850,000
107	Bldg. 1067 North Parking Lot	1	150' x 250'	824'	Encroachment + 3' beyond pad	37,500
108	Bldg. 1067 Connex Boxes	2	2 (8' x 40')	120'	360 sq ft	360
109	Bldg. 1067 Parking	1			Encroachment + 3' beyond parking lot, Bldg 1067 perimeter, loading ramp	54,000
110	Bldg. 1035 gravel parking west and east	1			Treat gravel to maintain veg free.	80,400
111	MK19 Range Flag Pole	1	3' x 3'	12'	3' around base of pole	9
112	MK19 Range Tower	1	30' x 30'		Tower supports, concrete pads, as needed underneath	900
113	MK19 Range Ammo Distribution Bldg	1	15' x 15'		Bldg perimeter + 3' beyond	324
114	MK19 Range Shelter w/ Bleachers	1	30' x 50'		Under shelter canopy and under/around bleachers as needed	1,500
115	MK19 Range Gravel Lot	1	100' x 250'		Encroachment + 3' beyond pad	26,059
116	MK19 Range Firing Points	3	25' x 25', 25' x 50', 25' x 100'		Gravel Pads, berms + 3' encroachment beyond berms	4,375

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
117	MK19 Range Target Coffins	39	15 (25' x 25'), 24 (10' x 10')		Inside target coffins as needed + 3' encroachment beyond coffins	11,775
118	MK19 Range Gates	6	12 (3' x 3')		3' around gate posts	108
119	MK 19 Range Left and Right Limit Markers	4	4 (6' x 6')		3' around marker posts, under markers	144
120	MK19 Range Lane Markers	6	6 (10' x 10')		3' around marker posts, under markers	600
121	MK19 Range Bunkers	3	2 (25' x 25'), 75' x 50'		All veg. on gravel area, concrete aprons, and concrete bunker face, woody veg. on balance	4,400
122	MK19 Range Creek	1	3,610' x 20'		Woody vegetation (willow, aspen, locust saplings) in creek channel and on creek banks as needed	72,000
123	MK19 Range Firing Lanes	4	4 (330' x 1970')		Woody vegetation (willow, aspen, locust saplings) in firing lanes needed - heavy woody vegetation in Lane 1	650,100
124	Grenade Qualification Range Parking Area	1			Entire Area as needed + 1 foot beyond	8,000
125	Grenade Qualification Range Access Path	1	500' x 15'		Encroachment + 1 foot on either side of path	8,000
126	Grenade Qualification Range Targets	7	15' x 15'		Encroachment + 1 foot on all sides	1,792
127	Grenade Qualification Range Firing Points	7	10' x 5'		Encroachment + 1 foot on all sides	588
128	Grenade Qualification Range – Greenleaf Road Bank	1	900' x 20'		Woody vegetation 10 feet either side of ditch center	18,000
129	MPQC Range Tower	1	25' x 25'		Tower supports, concrete pads, as	625

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
					needed underneath	
130	MPQC Parking Lot	1	75' x 125'		Encroachment + 3' beyond pad	9,375
131	MPQC Flag Pole	1	3' x 3'		3' radius around base of flagpole	28
132	MPQC Foot Bridge Approaches	2	10' x 10'	120'	Encroachment + 1' beyond abutments	68
133	MPQC Target Shed	1	16' x 32'	120'	Bldg perimeter + 3' beyond	324
134	MPQC Range Limit Markers	2	6' x 6'	64'	Encroachment + 1' beyond markers	56
135	MPQC Firing Lanes	5	6' x 50'	560'	Encroachment only	1,500
136	MPQC Ready Line	1	6' x 50'	112'	Encroachment only	300
137	MPQC Firing Walls	10	1' x 2'	140'	Encroachment + 1' beyond firing walls	100
138	MPQC Target Line	1	10' x 50'	128'	Encroachment + 1' beyond target line	124
139	MPQC Access Path	1	6' x 125'	262'	Encroachment only	750
140	MPQC Stream Banks	2	10' x 126'		Target woody vegetation along banks (willows)	2,520
141	M203 Range Flagpole	1	3' x 3'		3' radius around base of flagpole	28
142	M203 Range Tower	1	25' x 25'	108'	Tower supports, concrete pads, as needed underneath	104
143	M203 Range Parking Lot	1	100' x 150'	504'	Encroachment + 1' beyond lot	508
144	M203 Range Firing Points	8	5' x 5'	28'	Encroachment + 1' beyond firing points	192
145	M203 Range Targets	16	20' x 20'	88'	Encroachment + 1' beyond targets	1,344
146	M203 Range Access Path	1	5' x 50'	118'	Encroachment + 1' beyond path	114
147	LRC Rappel Tower	1	25' x 25'	108'	Tower supports, concrete pads, as needed underneath	104
148	LRC Parking Lot	1	75' x 125'		Encroachment + 3' beyond pad	9,375
149	LRC Access Path	1	20' x 1,300'		Encroachment only	26,000
150	LRC Obstacles	8	50' x 50'		Encroachment only	20,000
151	Housing Area Houses	15	35' x 40'	158'	Encroachment + 1' beyond foundation	154

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
152	Housing Area Parking Garages	7	25' x 35'	128'	Encroachment + 1' beyond foundation	124
153	Family Housing and Bldg 1033 Area Expanse Area	1			Treat for poison ivy as encountered.	1,000,000
154	Old Admin Area "Parade Field"	1			Treat for poison ivy as encountered. Treat building perimeters, mowing obstacles, gravel, bridge launch staging area, and mine trainer sand pit to maintain veg free.	480,000
155	HG Familiarization and Demo Range Parking	1			Treat entire area + 1 ft beyond	12,000
156	HG Familiarization Range	2			Treat access lane, target, firing position, tower, and lanes to keep woody brush out and veg free perimeter.	43,000
157	Live Demo Range	1			Treat access lane, pit and safety shelter to keep woody brush out and veg free perimeter.	45,000
158	Fire and Maneuver Range	1			Treat parking lot and access road.	30,000
159	MRF Range	1			Treat parking lot, building perimeters, firing point, target coffins/berms, access roads, firing lanes to maintain free of woody veg and veg free perimeter.	1,000,000
160	CPMPFQC	1			Treat parking lot, building perimeters, firing point, target coffins/berms, access roads, firing lanes to maintain free of woody veg	17,000

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
					and veg free perimeter.	
161	25 Meter KD Range	1			Treat parking lot, building perimeters, firing point, target coffins/berms, access roads, firing lanes to maintain free of woody veg and veg free perimeter. Parking included in CPMPFQC.	8,800
162	BLD 1037 + Rear Lot and Gravel Road	1		365'	Treat building perimeter at 1' and gravel lot to keep veg free.	14,300
163	BLDG 1038	1		550'	treat bldg perimeter at 1'	550
164	BLDG 1034 + Parking	1		340' (3 sides)	Treat building perimeter at 1' and gravel lot to keep veg free.	111,000
165	BLDG 1036	1		260'	treat bldg perimeter at 1'	260
166	BLDG 1047 and adjacent gravel	1		250'	Treat building perimeter at 1' and gravel lot to keep veg free.	4,700
167	BLDG 1068	1		340'	Treat bldg perimeter at 1' and propane tank.	340
168	BLDG FE-6 (Main Gate Guard House)	1		100'	Treat bldg perimeter at 1'	100
169	Cantonment Area 1 Class IV Storage	1		1,150'	Treat to keep veg free.	41,400
170	Solar Field Panels	2		370'	Treat under panels to keep woody veg free and edge to keep veg free.	2,700
171	Contonment Area 1 Septic Mound/Fields and Alternate Septic Fields	2		2,000'	Treat as needed to maintain free of woody veg. Two locations.	113,000

Herbicide Applications Buildings and Miscellaneous Areas						
	Location	**QTY**	**Structure Dimensions**	**Spray Perimeter**	**3' Zone**	**Total (Square Feet)**
172	Old Rec Hall Parking Lot	1		620'	Treat gravel to maintain veg free.	15,800
173	BLDG 1033	1	125' x 35', 45' x 35' (T-Shaped)	422'	Encroachment + 1' beyond foundation	416
174	BLDG 1030 Parking Lot	1	140' x 550'	1,388'	Encroachment + 1' beyond lot	1,384
175	Safety Shelters (Bunkers 7B4, 7B5, 6B5, 6B4, 5B5, 5B4, 1C7-1C1, 4E1, 4E2, 5D1, 3D1, 3D2)	18			17,500 sq ft earth covered bunker - woody vegetation only, 5,000 sq ft asphalt apron and 500 sq ft concrete bunker façade - all vegetation	414,000
176	ASP Bunkers (6C1-6C5, 5D2, 6D1, 7D8-7D13)	14			17,500 sq ft earth covered bunker - woody vegetation only, 5,000 sq ft asphalt apron and 500 sq ft concrete bunker façade - all vegetation	322,000
177	Conditionally Exempt Storage C-Block 7C1-7C4	4			Treat headwalls, ventilators, and aprons to keep free of vegetation.	1,500
178	C-Block leased igloos 3C10-3C12	3			Treat headwalls, ventilators, and aprons to keep free of vegetation.	1,200
	Totals	**566**				**12,266,682**

5. **Roads and Roadside Mowing Obstructions:** Treat to control all vegetation on road surfaces as it occurs and mowing obstructions along designated roads. All vegetation within the designated treatment zone is required to be treated and controlled. Contractor shall treat all roadside mowing obstructions (EXCEPT wells – DO NOT TREAT WELLS) as they encounter them creating a three-foot, vegetation clear, zone around each obstruction. The main roads to be treated are listed in the below table. Other roads may be added as necessary.

Roads and Roadside Mowing Obstructions											
	Road Name	**Miles**	**Hydrants**	**Signs**	**Culverts**	**Manholes**	**Poles**	**Guy-wires**	**Boxes**	**Electrical Covers**	**Other**
1	Artillery Pads Access Road	0.2	0	0	2	0	0	0	0	0	0
2	ASP Access (Lane 6C south)	0.4	0	2	12	0	0	0	0	0	0
3	Blackberry Lane	0.9	0	0	0	0	0	0	0	0	0
4	Buckeye Village Access Roads	0.17	0	2	4	0	0	0	0	0	0
5	Bundling Road	1.1	0	14	5	0	0	0	0	0	0
6	Cobb's Pond Access Road	0.1	0	0	2	0	0	0	0	0	0
7	Conditionally Exempt Storage Access (Lane C7 south, Wet Storage east)	0.3	0	1	10	0	0	0	0	0	0
8	Construction Road	0.6	0	4	11	0	0	0	0	0	0
9	Cantonment Area 1 Roads	2.9	3	18	4	1	57	35	0	3	0
10	County-Line Road	1.3	0	0	1	0	0	0	0	0	0
11	Depot Area Roads	1.7	1	some	many	some	some	some	0	0	0
12	Depot Training Village Access Road	0.4	0	2	3	0	0	0	0	0	0
13	Detonator Spur	0.4	1	5	2	0	0	0	0	0	0
14	Drop Zone Access Road	0.25	0	0	0	0	0	0	0	0	0
15	East Martin Trail	0.5	0	10	4	0	0	0	0	0	0
16	East Patrol	0.5	0	10	4	0	0	0	0	0	6
17	Fuse & Booster Road	2.2	4	22	6	0	26	4	0	0	0
18	Fuse & Booster Spur	1	0	9	7	0	1	1	0	0	0
19	George Road	2.8	8	39	25	3	40	13	14	2	0
20	Greenleaf Road	4.7	0	50	43	0	3	0	0	0	0
21	Group 2 Roads and Old Railbeds	4.2	0	20	25	0	0	0	0	0	0
22	Group 3 Old Railroad Beds	2.3	0	10	15	0	0	0	0	0	0

Roads and Roadside Mowing Obstructions											
	Road Name	**Miles**	**Hydrants**	**Signs**	**Culverts**	**Manholes**	**Poles**	**Guy-wires**	**Boxes**	**Electrical Covers**	**Other**
23	Group 4 Access	0.4	0	5	0	0	1	0	0	0	0
24	Group 4 Old Railroad Beds	2.2	0	0	0	0	0	0	0	0	0
25	Group 6 (Road and Old Railroad Bed)	1.4	4	1	6	3	22	5	2	0	0
26	Group 7 Maneuver Trails (old railbeds)	8.7	0	6	50	0	0	0	0	0	0
27	Group 8	2	4	6	0	0	0	0	0	0	0
28	HG and Live Demo Range Access Road	0.2	0	3	3	0	0	0	0	0	0
29	Irons Road	0.4	0	4	0	0	0	0	0	0	0
30	Kelly's Pond Access Road	4	0	2	3	0	0	0	0	0	0
31	Knapp Road	0.7	0	0	6	0	0	0	0	0	0
32	Lane 3C north	0.8	0	2	18	0	0	0	0	0	0
33	Lane 8E	0.25	0	0	0	0	0	0	0	0	0
34	Lanning Trail	0.85	0	55	19	0	0	0	0	0	12
35	Load Line 1 Road	1.1	0	18	0	0	0	0	0	0	0
36	Load Line 2 Road	1.2	0	13	0	0	3	0	0	0	0
37	Load Line 3 Road	1.2	0	20	4	0	0	0	0	0	0
38	Magazine Road	0	0	9	6	0	0	0	0	0	0
39	McAllister Road	0.6	0	17	4	0	0	0	0	1	0
40	McCormick Road	2.1	0	35	15	0	0	0	0	0	0
41	McKibben Road	1.5	1	124	20	1	0	0	0	0	12
42	MK-19/MPMG Range Roads	6	0	0	0	0	0	0	0	0	0
43	MK-19/MPMG Range East Access Road (old railroad bed)	0.8	0	3	5	0	0	0	0	0	0
44	Newton Falls Road	7.9	0	80	62	0	1	0	0	7	0
45	North Line Road	1.7	0	21	13	0	1	0	0	0	0

Roads and Roadside Mowing Obstructions											
	Road Name	**Miles**	**Hydrants**	**Signs**	**Culverts**	**Manholes**	**Poles**	**Guy-wires**	**Boxes**	**Electrical Covers**	**Other**
46	Oil Well Access Road	0.3	0	0	3	0	0	0	0	0	0
47	Pad Road North of Daugherty's Pond	0.25	0	2	2	0	0	0	0	0	0
48	Paris-Windham Road	4	0	51	14	0	5	0	0	4	0
49	Perimeter Road	29	0	21	46	3	13	0	1	0	13
50	Post 19 Access Road (Railroad Access)	0.2	0	3	0	0	0	0	0	0	0
51	Ramsdell Road	1	0	11	0	0	1	0	0	0	2
52	Randall Road	1	0	8	0	0	1	0	0	0	0
53	Rehard Trail	0.5	0	13	6	0	0	0	0	0	23
54	Remalia Road	1.7	0	10	1	0	2	0	0	0	0
55	Route 80	2.5	3	36	7	0	4	0	2	2	0
56	Route 80 Depot Access Roads	1.5	2	5	12	6	0	0	0	0	4
57	RTI Off Road Course (north Grp-1 old railroad beds)	1.5	0	0	16	0	0	0	0	0	0
58	Sectionalizing Access Rd	0.5	8	0	0	0	0	0	0	0	0
59	Slagle Road	1.4	0	18	14	0	0	0	0	0	0
60	Smalley Road	7	0	54	47	0	2	0	0	2	
61	Smallsreed Road	0.6	0	2	4	0	0	0	0	0	0
62	Snow Road	1.2	0	10	2	0	0	0	0	0	0
63	Snow Road Cut-Off	0.2	0	0	0	0	0	0	0	0	0
64	South Patrol Road	1.5	0	14	9	0	0	0	0	0	0
65	South Service Road	5.4	20	33	9	0	18	0	0	6	0
66	Tank Table II Target Berm Access Trails	0.7	0	2	0	0	0	0	0	0	0
67	Tank Trail north of Grp 3	1.2	0	2	6	0	0	0	0	0	0

Roads and Roadside Mowing Obstructions											
	Road Name	**Miles**	**Hydrants**	**Signs**	**Culverts**	**Manholes**	**Poles**	**Guy-wires**	**Boxes**	**Electrical Covers**	**Other**
68	Thompson Trail	1.4	0	42	12	0	0	0	0	0	28
69	Training Area 13 Access (Slagle DZ)	1.4	0	4	6	0	0	0	0	0	0
70	Training Area 21 Access	0.4	0	3	4	0	0	0	0	0	0
71	Training Area 19 Access	0.3	0	0	6	0	0	0	0	0	0
72	Training Area 20 Access (Demolition Rd.)	0.6	0	7	0	0	1	0	0	0	0
73	TTB Access Roads	2	0	10	15	0	0	0	0	0	15
74	Wadsworth Road	0.5	0	3	9	0	0	0	0	0	0
75	West Substation Road	0.2	0	0	0	0	0	0	0	0	0
76	Wilcox-Wayland Road	2	0	18	6	0	3	0	0	0	0
77	Winklepeck Road	2.25	0	5	8	0	0	0	0	0	0
	Totals	**149**	**59**	**1029**	**683**	**17**	**205**	**58**	**19**	**27**	**115**

6. **Roadside Ditches:** Treat to control woody vegetation one foot beyond the top of the backside of the ditches or 10 feet out from of the road edge if there is no defined ditch along designated roads. All the woody vegetation within the designated treatment zone is required to be treated and controlled. In addition to roadside ditches, the Contractor is responsible for treating around guardrails, bridge abutments, and headwalls if vegetation is present. Contractor shall NOT treat around wells if they are within the treatment zone. Roadside ditch vegetation treatment is as on an as needed (if woody vegetation is present) basis. The main road ditches to be treated are given in the above table but may also include other roads as needed.

APPENDIX G

MINOR FOREST PRODUCTS SALE PROCEDURE

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RAVENNA TRAINING AND LOGISTICS SITE (RTLS)

Minor Forest Products
Sale Procedure

3 October 1994 (Rev. 23 May 2006) No. FOR-001

1. Purpose. This procedure describes the policies, responsibilities, and procedures by which firewood and small amounts of other forest products may be sold by the Ravenna Training and Logistics Site (RTLS).

2. Scope. This procedure applies to all in-house sales of minor forest products sold on a unit price per permit basis (firewood, locust posts, aspen trees, woodchips, salvaged sawtimber, etc.) and other non-permit sales with an estimated fair market value of up to $5,000.00. There is no annual limit on receipt totals.

3. Eligibility. All United States citizens 18 years old and older are eligible to buy minor forest products under this procedure.

4. Policy.

a. Minor forest products will be sold under the authority of the Commanding Officer or the Commanding Officer's designated representative in accordance with AR 405-90; AR 200-3, Army Guidance for Timber Sales, and the Corps of Engineers regulations on small sales of real property.

b. Sales may be made for both standing trees and downed material.

c. Minor Forest Products will be sold by permit at a per unit price determined by the Forester or by lump sum under a simple timber sale agreement. Permit sales will be used whenever possible.

d. Access to the RTLS will be granted only once per permit. Failure to remove the entire permitted volume of minor forest products in one trip will not constitute reentry.

e. Permits will be made available on a first come first served basis. At any one time permits may be sold to an individual up to the maximum minor forest products sale value identified in this procedure.

f. When sale by permit is not appropriate to facilitate access and removal of minor forest products (such as in the salvage sale of sawtimber that requires an unknown number of trips to access the sale area) sales may be made using a simple timber sale agreement. These sales will be made at or above the estimated fair market value.

g. Individual sales may not exceed the maximum minor forest products sale value identified in this procedure.

h. Minor forest product sales will be used to support tree clearing on minor construction projects and mission related activities; to cost effectively utilize wood products that might otherwise go to waste; to provide for the timely disposal of low value forest products; to help the RTLS be a better steward of publicly owned renewable natural resources; to meet the public demand for wood products available at the RTLS; and to assist in meeting the management objectives in the Integrated Natural Resources Management Plan.

5. Responsibility.

a. The RTLS Commander is responsible for review and approval of this procedure.

b. The RTLS Environmental Office is responsible for developing and implementing this procedure, designating and administering all sales, determining fair market value of products being sold, soliciting interested parties if warranted, issuing permits, developing sales agreements, tracking sales, and collecting sales receipts, and submitting sales receipts to the Louisville District Engineer for deposit through DFAS into account number 21F3875.3960 20-C S99999.

6. Procedure.

a. Permit Sales

(1) When minor forest products are available, permits will be sold on a first come first served basis. The buyer is responsible for loading and removing purchased products.

(2) Permits will be made available as long as products are is available and as long as removal does not interfere with military operations.

(3) The permit will be issued by the RTLS Environmental Office upon receipt of payment.

(4) The permit will be shown to the security guard upon request to enter the installation. Entry will not be granted without a valid unexpired permit. Only those listed on the permit will be granted access.

(5) The permit will be left with the security guard at post 1 upon leaving the installation as authority to remove the wood.

(6) Payment will be made in cash unless a large number of permits are purchased at one time and then a check made payable to "USAED Louisville" may be used.

b. Permit Prices

(1) Firewood = $10 per load up to one cord (4' X 4' X 8' stack of wood)

(2) Woodchips = $1.00 per cubic yard

(3) Locust Posts, 8 foot = $.50/post

(4) Locust Posts, 16 foot = $1.50/post

(5) Aspen Chopping Blocks = $2.00/tree

(6) Pulpwood = $2.00/ton

(7) Sawtimber = estimated fair market value/bd. ft., Doyle Rule

c. Non-Permit Sales

(1) The RTLS Environmental Office will determine when sales are needed, or when a public request for a sale can be met, and will designate the sale area and determine the estimated fair market value for the forest product being sold.

(2) The sale will be coordinated with the Corps of Engineers District Office in Louisville, KY to ensure compliance with applicable regulations on sale of real property (502-624-5347 or 502-315-7018).

(3) In accordance with Corps of Engineer sale regulations, sales with an estimated value under $15,000 may be done by negotiated sale. Bids are not required for any sales within the approved maximum limit of in this procedure of $5,000. Sales will be negotiated at a price at or above the estimated fair market value.

(4) If two or more parties are interested in the same item or if a negotiated sale price at or above the estimated fair market value cannot be agreed upon, sealed bids will be solicited.

(5) Bids below the estimated fair market appraisal will not be accepted. If all bids are below the estimated fair market value, each bidder will be given the chance, starting with the high bidder, to increase their bid. The

sale will be made to the first bidder to meet or beat the fair market appraisal. If no bidder meets the estimated fair market value with their second bid, either the sale will not be made, additional bidders will be sought, or the fair market value will be adjusted based on the evidence of the bids and the sale made. The determination on how to proceed will be made by the RTLS.

(6) Non-Permit sales will be made using the Minor Forest Products Sale Agreement. Agreements will be good for a six-month period. Extensions may be given at the discretion of the RTLS Environmental Office.

(7) Payments will be made by check payable to "USAED Louisville".

d. General.

(1) All sales must comply with the National Environmental Policy Act and AR 200-2 requirements.

(2) Access will be permitted to the harvest area only. Permit holders will be provided a map and shown where their harvest area is located, and its boundaries.

(3) Access will be permitted Monday through Sunday in accordance with the gate schedule. Access will not be permitted during deer hunts or if it interferes with the completion of the RTLS mission. Holiday access will be permitted on a case by case basis.

(4) A refund of the purchase price will not be given for failure to remove the forest product prior to expiration of the permit/agreement.

(5) Permits/Agreements are not transferable.

(6) The holder of the permit/agreement must be present when harvesting is going on and in order for others to be granted access under the permit.

(7) The permit/agreement may be revoked without a refund for violation of RTLS safety or security requirements, or for being in unauthorized areas.

7. References.

a. AR 405-90

b. AR 200-3

c. Army Guidance for Timber Sales

d. Corps of Engineers regulations on small sales of real property

_____ _____

Thomas A. Tadsen
LTC, AV, OHARNG
Garrison Commander-RTLS

Date

RAVENNA TRAINING AND LOGISTICS SITE

MINOR FOREST PRODUCTS
SALE PROCEDURE

PERMIT

ATTACHMENT 1

RAVENNA TRAINING AND LOGISTICS SITE
1438 State Route 534 SW
Newton Falls, OH 44444
(614) 336-6568

MINOR FOREST PRODUCTS SALE PERMIT

Number: _____
Date: _____
Expires: _____

Type of Forest Product:

___ Down or Standing firewood @ $10/load up to a cord (4'x4'x8'stack of wood) X _____ loads = $_____/permit
___ Woodchips @ $1.00/cubic yard X _____ cubic yards = $_____/permit
___ Locust Posts, 8' @ $.50/post X _____ posts/load = $_____/permit
___ Locust Posts, 16' @ $1.50/post X _____ posts/load = $_____/permit
___ Aspen chopping blocks @ $2.00/tree X _____ trees/load = $_____ /permit
___ Pulpwood @ $2.00/ton X _____ X tons/load = _____/permit
___ Sawtimber @ $_____/ bd. ft. X _____ bd. ft/load = $_____/permit

This permit entitles the holder to remove the above identified forest products in accordance with the conditions described below from the designated area within the Ravenna Training & Logistics Site (RTLS).

Permit Holder Name: _____ **Phone**: _____

Address: _____

Designated Cutting Area: _____

Assistants: **1.** _____ **2.** _____

3. _____ **4.** _____

The permit holder certifies that he/she and any assistants are U. S. citizens and agree to comply with all the conditions stipulated below.

1. Permit holder is responsible for cutting wood to length, and loading and removing it from the RTLS.

2. Access to the RTLS will be permitted one time from 7:00 am to 8:00 p.m. Monday through Sunday excluding holidays, deer hunt days, and when access interferes with site operations. Access at other times must be approved in advance. Ingress and Egress will be granted through Post 1 on Rt. 5 at scheduled gate times.

3. Access will be granted only once per permit whether or not a full load has been removed. Each vehicle permitted access must be equipped with at minimum a 2.5 lb ABC type fire extinguisher.

4. The permit holder will show the guard his/her permit to gain entry, and will relinquish the permit to the guard at Post 1 when leaving. Relinquishing the permit will facilitate authority to take the firewood off post.

5. The permit holder may bring four (4) additional people in to help with the removal of the firewood. The assistants must be U. S. citizens and their names must appear on this permit. Persons under the age of 18 must be accompanied by a parent or legal guardian. The permit holder must be present for assistant to have access.

6. The permit holder and assistants are only permitted to be in the designated cutting area and access roads.

7. Prohibited items will not be brought on the RTLS property, i.e. firearms, alcoholic beverages, matches, flame producing devices, narcotics, or drugs of any kind. Vehicles and personnel are subject to search and seizure.

8. Trash and refuse of any kind may not be left at the harvest site or deposited on the installation.

9. Smoking is not permitted while on the installation.

10. Slash, treetops, and other debris will be left out of ditches, rights-of-way, and other clear areas. The harvest site must be restored to the pre-harvest condition if damaged by the permit holder.

11. The US Government, the Ohio Adjutant General's Department and RTLS/RVAAP contractors are not responsible to provide any emergency assistance for broken down vehicles, equipment, or injuries. The permit holder is totally responsible for all vehicles, equipment, and the safety of himself/herself and assistants.

Call Post 1 at **330-358-2017** in case of an emergency.
12. No refund will be made if this permit expires, if less than the specified volume of forest products are removed, or if the permit holder is banned from the training site for violation of RTLS rules/regulations.
13. This permit may not be assigned or transferred in part or in whole to another party.
14. This permit may be revoked without refund for failure to comply with the above.

I have read understand, and will abide by the above rules.

In consideration of a permit having been granted to procure forest products on a United States Government Facility located in Portage and Trumbull Counties, Ohio, the undersigned, for himself, his heirs, executors, administrators, and assignees, does hereby release the U. S. Government, the State of Ohio, The Army, The Adjutant General's Department, the Ohio National Guard, and RTLS/RVAAP Contractors, their officers, agents, and employees from all claims, demands, actions, and causes of action for damage to property or injury or death, while exercising the privileges granted by the permit hereinabove referred to.

The undersigned will protect and indemnify the U. S. Government, the State of Ohio, The Army, The Adjutant General's Department, the Ohio National Guard, and RTLS/RVAAP Contractors, their officers, agents, and employees against all claims, demands, actions, and causes of action for damage to property or injury or death arising in like manner, as mentioned above, with respect to his spouse, children, and ward who share the privileges granted by said permit.

I further acknowledge that I am aware that there are no emergency services available at the RTLS and that I am fully responsible for the cost of any and all emergency service calls made on my behalf while on the RTLS. In case of an emergency I must contact Post 1 security at **330-358-2017** or other designated number and identify my situation, location, and needed emergency services.

Signature:

_____ Date: _____

Permit Holder

Validation and Payment Received:

_____ Date: _____

RTLS Environmental Supervisor

RAVENNA TRAINING AND LOGISTICS SITE/RAVENNA ARMY AMMUNITION PLANT

MINOR FOREST PRODUCTS
SALE PROCEDURE

SALE AGREEMENT

ATTACHMENT 2

RAVENNA TRAINING AND LOGISTICS SITE
1438 State Route 534 SW
Newton Falls, OH 44444
(614) 336-6568

MINOR FOREST PRODUCT SALE AGREEMENT

Number: _____
Date: _____
Expires: _____
(6 Months)

Product Description: _____

Product Location: _____

Sale Price: _____

Buyer Name: _____ **Phone:** _____

Buyer Address: _____

Assistants: 1. _____ **2**. _____

3. _____ **4**. _____

In accordance with AR 405-90; AR 200-3, para 5-2 b. (1) (c); Army Guidance for Timber Sales, and Corps of Engineers regulation on small sales of real property, the United States Government agrees to sell to the buyer the above described forest products at the above stated sale price, and in accordance with the below stated terms and conditions.

The buyer certifies that he/she and all assistants are US citizens and agree to comply with all the conditions stipulated below.

1. The buyer agrees the above description accurately describes the forest products being purchased.

2. The buyer is responsible for cutting the forest products to length, and loading and removing them from the RTLS. Buyer shall furnish all equipment and labor. No equipment or fuel will be left over night at the RTLS.

3. Access to the RTLS will be permitted one time from 7:00 am to 8:00 p.m. Monday through Sunday excluding holidays, deer hunt days, and when access interferes with site operations. Access at other times must be approved in advance. Ingress and Egress will be granted through Post 1 on Rt. 5 at scheduled gate times.

4. Each vehicle permitted access must be equipped with at minimum a 2.5 lb ABC type fire extinguisher and a shovel. They must be readily available during the harvest operation.

5. The buyer may bring in an additional four people to help with the removal of the forest products. The assistants must be US citizens and their names must appear on this agreement. Only those listed will be granted access. The buyer is responsible for the conduct of these persons. Persons under the age of 18 must be accompanied by a parent or legal guardian.

6. The buyer and assistants are only permitted to be in the designated harvest area and access roads.

7. Prohibited items will not be brought on the RTLS property, i.e. firearms, alcoholic beverages, matches, flame producing devices, narcotics, or drugs of any kind. Vehicles and personnel are subject to search and seizure.

8. Trash and refuse of any kind will not be left at the harvest site or deposited on the training site.

9. Smoking is not permitted while on the training site.

10. Slash, tree tops and other debris will be left out of ditches, rights-of-way, and other clear areas.

11. The buyer agrees to repair and restore any RTLS property damaged by his/her harvest and removal of forest products to include, but not limited to, leveling ruts, repairing ditches and fences, and establishing an RTLS approved grass cover on disturbed areas as deemed necessary by the RTLS Forester. The RTLS Forester will determine when damage is excessive and requires repair.

12. The buyer must have a pre-harvest conference with the RTLS Forester to discuss their proposed schedule and harvest operation prior to beginning the harvest.

13. No refund will be made if this agreement expires, if less than the stated amount of wood products are available and/or removed, or if the buyer is banned from the installation prior to completing the harvest.

14. This agreement may not be assigned or transferred in part or in whole to another party.
15. This permit may be revoked without refund for failure to comply with the above or any other RTLS rule/regulation.
16. The US Government, the Ohio Adjutant General's Department and RTLS/RVAAP contractors are not responsible to provide any emergency assistance for broken down vehicles, equipment, or injuries. The permit holder is totally responsible for all vehicles, equipment, and the safety of himself/herself and assistants. Call Post 1 at **330-358-2017** (or other designated number) in case of an emergency.

I have read understand, and will abide by the above requirements.

In consideration of this agreement and permission being granted to procure forest products on a United States Government Facility located in Portage and Trumbull Counties, Ohio, the undersigned, for himself, his heirs, executors, administrators, and assignees, does hereby release the U. S. Government, the State of Ohio, The Army, The Adjutant General's Department, the Ohio National Guard, and RTLS/RVAAP Contractors, their officers, agents, and employees from all claims, demands, actions, and causes of action for damage to property or injury or death, while exercising the privileges granted by the permit hereinabove referred to.

The undersigned will protect and indemnify the U. S. Government, the State of Ohio, The Army, The Adjutant General's Department, the Ohio National Guard, and RTLS/RVAAP Contractors, their officers, agents, and employees against all claims, demands, actions, and causes of action for damage to property or injury or death arising in like manner, as mentioned above, with respect to his spouse, children, and ward who share the privileges granted by said permit.

I further acknowledge that I am aware that there are no emergency services available at the RTLS and that I am fully responsible for the cost of any and all emergency service calls made on my behalf while on the RTLS. In case of an emergency I must contact Post 1 security at **330-358-2017** or other designated number and identify my situation, location, and needed emergency services.

Signature:

_____ Date: _____
Buyer

Validation and Payment Received:

_____ Date: _____
RTLS Environmental Supervisor

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APPENDIX H

PLANNED TIMBER HARVEST SCHEDULE

AND

TIMBER STAND IMPROVEMENT SCHEDULE

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Camp Ravenna Timber Harvest Schedules
2013-2019

Table 1-FY 2013 Camp Ravenna Timber Harvest Schedule

Compartment	Cutting Unit	Sawtimber Stand Acreage	Silvicultural System	Purpose
1	A	70	Single tree selection, small group selection & crop tree release	Retain mature woods while providing for growth and regeneration of shade mid and intolerant species. Also, reduce overabundant beech density.
1	W	102	Single tree selection. Site broken into two sub-units, 1W West (25 acres – includes two-acre diameter limit cut for beaver habitat) & 1W-East (77 acres), located on the East side of Bundling Pond.	Retain mature woods while providing for growth and regeneration of shade mid and intolerant species by removing inferior trees and reduce basal area to enhance condition of residual stock.
1	Z	29	Single Tree Selection	Retain mature woods while providing for growth and regeneration of shade mid and intolerant species.
5	X	5	Clearcut	Salvage Harvest all merchantable sawtimber for new F&M range.
Total		206		

Table 2-FY 2014 Camp Ravenna Timber Harvest Schedule

Compartment	Cutting Unit	Sawtimber Stand Acreage	Silvicultural System	Purpose
2	A	95	Single tree selection, small group selection, crop tree release	Retain and enhance mature woods while providing conditions for growth & regeneration of shade mid and intolerant species.
2	I	127	Single tree selection, small group selection, crop tree release	Retain and enhance mature woods while providing conditions for growth & regeneration of shade mid and intolerant species.
5	W	10	Clearcut	Salvage all merchantable sawtimber for mission essential range site.
Total		232		

TABLE 3-FY 2015 CAMP RAVENNA TIMBER HARVEST SCHEDULE

COMPARTMENT	CUTTING UNIT	SAWTIMBER STAND ACREAGE	SILVICULTURAL SYSTEM	PURPOSE
3	A	40	SINGLE TREE SELECTION, CROP TREE RELEASE	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
3	D	10	SINGLE TREE SELECTION, CROP TREE RELEASE	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
3	E	59	SINGLE TREE SELECTION, CROP TREE RELEASE	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
Total		169		

TABLE 4-FY 2016 CAMP RAVENNA TIMBER HARVEST SCHEDULE

COMPARTMENT	CUTTING UNIT	SAWTIMBER STAND ACREAGE	SILVICULTURAL SYSTEM	PURPOSE
4	K1	80	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
4	V	22	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
4	W (EAST END)	38	SINGLE TREE SELECTION	ENHANCE CONDITION OF MATURE WOODS WHILE ELIMINATING UNHEALTHY, UNDESIRABLE TREES.
4	Y1	36	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
Total		176		

TABLE 5-FY 2017 CAMP RAVENNA TIMBER HARVEST SCHEDULE

COMPARTMENT	CUTTING UNIT	SAWTIMBER STAND ACREAGE	SILVICULTURAL SYSTEM	PURPOSE
5	W	37	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
5	X	54	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
5	Y	40	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
Total		131		

TABLE 6-FY 2018 CAMP RAVENNA TIMBER HARVEST SCHEDULE

COMPARTMENT	CUTTING UNIT	SAWTIMBER STAND ACREAGE	SILVICULTURAL SYSTEM	PURPOSE
6	K	107	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
6	U	71	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
Total		178		

TABLE 7-FY 2019 CAMP RAVENNA TIMBER HARVEST SCHEDULE

COMPARTMENT	CUTTING UNIT	SAWTIMBER STAND ACREAGE	SILVICULTURAL SYSTEM	PURPOSE
7	E3	11	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
7	I3	34	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
7	L3	87	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
7	V3	17	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
7	X3	50	SINGLE TREE SELECTION, CROP TREE RELEASE, SMALL GROUP SELECTION	RETAIN AND ENHANCE MATURE WOODS WHILE PROVIDING CONDITIONS FOR GROWTH & REGENERATION OF SHADE MID AND INTOLERANT SPECIES.
Total		199		

CAMP RAVENNA TIMBER STAND IMPROVEMENT SCHEDULES
2013-2019

TABLE 8-TSI FY 2013

COMPARTMENT	CUTTING UNIT	ACREAGE TREATED	TREATMENT OBJECTIVES	PURPOSE
1	V	54 & 24	CROP TREE RELEASE (54 ACRES), GRAPEVINE CONTROL (24 OF 54 ACRES)	RELEASE DESIRABLE HARDWOODS TO ENHANCE HEALTH AND VIGOR OF DESIRABLE SPECIES
1	Y	30	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
2	I	35	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
6	V	73	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
7	A	39	AMERICAN BEECH CONTROL	REDUCE AMOUNT OF OVERABUNDANT BEECH IN ORDER TO PROMOTE REGENERATION OF MULTIPLE NATIVE HARDWOOD SPECIES.
9	A	33	AMERICAN BEECH CONTROL	REDUCE AMOUNT OF OVERABUNDANT BEECH IN ORDER TO PROMOTE REGENERATION OF MULTIPLE NATIVE HARDWOOD SPECIES.
GROUP 1-A	GROUP 1-A	62	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
Total		350		

TABLE 9-TSI FY 2014

COMPARTMENT	CUTTING UNIT	ACREAGE TREATED	TREATMENT OBJECTIVES	PURPOSE
2	I	110	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
3	H9(LL9)	61	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
4	B-H (C-BLOCK SOUTH)	155	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
Total		326		

TABLE 10-TSI FY 2015

COMPARTMENT	CUTTING UNIT	ACREAGE TREATED	TREATMENT OBJECTIVES	PURPOSE
3	D(LL8)	37	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
3	F(LL10)	30	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
4	L1	86	GRAPEVINE CONTROL & CROP TREE RELEASE	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS FOR EXISTING, DESIRABLE HARDWOODS.
5	R,S,U	158	CROP TREE RELEASE & RETREAT GRAPEVINES	RELEASE DESIRABLE HARDWOODS (TREATMENT AREA EXCLUDES GROUP 4) AND CONTROL VINES INHIBITING GROWTH & REGENERATION OF DESIRABLE HARDWOOD
Total		311		

TABLE 11-TSI FY 2016

COMPARTMENT	CUTTING UNIT	ACREAGE TREATED	TREATMENT OBJECTIVES	PURPOSE
2	M-J	212	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS FOR EXISTING, DESIRABLE HARDWOODS.
3	E(LL6)	28	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
3	F(LL5)	29	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
9	D	15	CROP TREE RELEASE	RELEASE HEALTHY, DESIRABLE HARDWOODS FROM IMMEDIATE COMPETITION OF UNHEALTHY, INTERMEDIATE TREES.
9	F	15	CROP TREE RELEASE	RELEASE HEALTHY, DESIRABLE HARDWOODS FROM IMMEDIATE COMPETITION OF UNHEALTHY, INTERMEDIATE TREES.
Total		299		

TABLE 12-TSI FY 2017

COMPARTMENT	CUTTING UNIT	ACREAGE TREATED	TREATMENT OBJECTIVES	PURPOSE
1	A	60	AMERICAN BEECH CONTROL	REDUCE OVERABUNDANT BEECH IN ORDER TO PROMOTE REGENERATION OF MOST DESIRABLE HARDWOOD SPECIES FOLLOWING 2014 SELECTION HARVEST.
1	I	85	GRAPEVINE CONTROL & CROP TREE RELEASE	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS FOR EXISTING, DESIRABLE HARDWOODS.
3	F(LL10)	30	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
4	W(WEST)	27	CROP TREE RELEASE	RELEASE HEALTHY, DESIRABLE HARDWOODS FROM IMMEDIATE COMPETITION OF UNHEALTHY, INTERMEDIATE TREES.
5	C,J	63	GRAPEVINE CONTROL & CROP TREE RELEASE	RELEASE DESIRABLE HARDWOODS (TREATMENT AREA EXCLUDES GROUP 4) AND CONTROL VINES INHIBITING GROWTH & REGENERATION OF DESIRABLE HARDWOOD
7	W	20	CROP TREE RELEASE	RELEASE HEALTHY, DESIRABLE HARDWOODS FROM IMMEDIATE COMPETITION OF UNHEALTHY, INTERMEDIATE TREES.
Total		285		

TABLE 13-TSI FY 2018

COMPARTMENT	CUTTING UNIT	ACREAGE TREATED	TREATMENT OBJECTIVES	PURPOSE
4	O1-U1(E-BLOCK)	300	GRAPEVINE CONTROL	CONTROL INVASIVE SPECIES AND IMPROVE REGENERATION & GROWING CONDITIONS.
Total		300		

TABLE 14-TSI FY 2019

COMPARTMENT	CUTTING UNIT	ACREAGE TREATED	TREATMENT OBJECTIVES	PURPOSE
5	V	108	GRAPEVINE CONTROL CROP TREE RELEASE	REDUCE OVERABUNDANT BEECH IN ORDER TO PROMOTE REGENERATION OF MOST DESIRABLE HARDWOOD SPECIES FOLLOWING 2014 SELECTION HARVEST.
8	D	37	AMERICAN BEECH CONTROL	RELEASE HEALTHY, DESIRABLE HARDWOODS FROM IMMEDIATE COMPETITION OF UNHEALTHY, INTERMEDIATE TREES.
Total		145		

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APPENDIX I

DEER HUNT VOLUNTEER ESCORT INFORMATION

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Camp Ravenna Joint Military Training Center

Deer Hunt Volunteer Escort Program Information

9 September 2013

1. **Purpose**: The purpose of the CRJMTC volunteer escort (VE) program is to help manage public hunter access on the CRJMTC property to ensure hunters are hunting in assigned areas and in compliance with CRJMTC rules and regulations. VE's help to improve the safety of the deer hunts for people living in close proximity to the CRJMTC perimeter fence and the hunters. VE also function as an information source for hunters and help them have a more satisfying experience.

2. **Eligibility**: All VE's must be U.S. citizens who are 18 years old or older and must be eligible to possess an Ohio hunting license and deer permit. VE's must be physically capable of performing their assigned duties. At least one VE's of each VE pair must have a vehicle capable of and suitable for hauling hunters and deer if the need arises. VE's must complete an application and are subject to interview and acceptance by the CRJMTC. VE's may be subject to a favorable background check as dictated by CRJMTC Force Protection. Cost of the background check is the responsibility of the applicant. All VE's must receive training prior to being approved and periodically as required by the CRJMTC.

3. **VE Term of Service, Conduct, and Dismissal**: VE's serve as volunteers on a year by year basis and are subject to approval each year. VE's are in no way employed by the federal government or the State of Ohio and are not entitled to any rights, privileges, benefits, or compensation of said employees. VE's are required to be courteous and examples of good sportsmanship and to function with the utmost of professionalism toward the hunters. VE's are required to know the boundaries of their assigned hunt areas, the location of applicable No Hunting and/or restricted areas, and to follow the CRJMTC hunting rules. VE's are NOT permitted to bring guests on the CRJMTC property. VE's are not required or permitted to subject themselves to unsafe situations while performing their duties. VE's may be dismissed for violation of CRJMTC regulations, inappropriate behavior (on or off post), involvement in unethical or illegal activity, a hunting or firearms violation, a legal conviction, drug or alcohol abuse, failure to fulfill VE duties, engaging in unsafe activity, multiple complaints from hunters or CRJMTC staff, inability to perform VE duties for any reason, inability to get along with other VEs or CRJMTC staff, causing controversy or disruption, or any activity or situation that could be considered controversial and cast a bad light on the OHARNG or the ODOW.

4. **VE Coordinator**: One or more VE Coordinators will be designated to assist the CRJMTC Hunt Coordinator with VE program administration and coordination of VE field activities and to help resolve minor problems that arise. Problems not resolved by a VE Coordinator will go to the CRJMTC Hunt Coordinator for resolution. The current VE Coordinator is: Larry Johnson.

5. **VE Duties and Program Specifics**:

- VE's will assist with traffic control, parking, vehicle searches, hunter registration, deer check in, hunter sign out, and overseeing hunter activity in the field. Specific VE's will be assigned these tasks.

- VE's are expected to work all the hunts. VE's will be given a phone number to call if an emergency arises and they cannot make a hunt. Please call a number and talk to a person, not a machine. We want to work VE's in pairs and will try to replace no-shows.

- VE's must be signed in **not later than 0530 hours (5:30 a.m.)**. VE's must be at their designated parking lots by 0630 hours (6:30 a.m.). **VE's working registration, vehicle inspections, traffic**

control, and parking must arrive no later than 0430 hours (4:30 a.m.) and be ready at their work station by 0445 hours (4:45 a.m.).

- VE's must drive personal vehicles at their own expense. VE's may drive separate vehicles. At least one vehicle must be capable of hauling hunters and deer if the need to do so arises. VE vehicles will be inspected upon entry and exit of the CRJMTC. Vehicles must contain at minimum a 2.5 lb. ABC type fire extinguisher. It must also have an intact exhaust system. A CB or portable radio and/or cell phone are recommended for internal communications and safety.

- VE's will be issued hunting permits and a pass for their vehicle dashboard, which identifies them as a VE. When VE's arrive at the main gate the parking pass must be displayed on their dashboard. VE's will turn on vehicle interior light, stop and identify themselves with paperwork to the gate checkers and traffic control personnel, and then proceed to building 1048 parking lot to sign in and have their vehicle searched.

- VE's are required to work all day until their hunters leave. If hunters leave early, VE's may stay and exercise their option to hunt until 1600 hours (4:00 p.m.), or sign out and leave. An adequate number of VE's must stay after 1600 hours to help with collection of biological data and the sign out and clearing of all hunters from the field.

- VE's are required to be at their assigned hunt area parking lot no later than 0630 hours (6:30 a.m.) to meet their hunters. When the hunters arrive VE's are required to advise the hunters of their hunt area boundaries, how to access their area, and will ensure the hunters get to their assigned hunt area. **VE's must coordinate with their hunters and ask what, if any, assistance the hunters desire**. Inform the hunters that you are required to patrol the boundary of your hunt areas and that you will be hunting while in the field. VE's are not permitted to dictate how or where hunters will hunt within their hunt area or to exclude the hunters from any part of their hunt area. VE's may not cordon off any portion of a hunt area for their own exclusive use and must restrict their movements to the hunt area boundaries if asked to stay out of the area by the hunters. Do not interfere with the hunters. VE's are not in the field to focus on their own hunt. VE hunting is incidental to performing VE duties. At least one VE of the pair must be on site in the field patrolling the perimeter of the hunting areas, driving the perimeter, or at the designated parking lot at all times. Perimeter checks must be made at regular intervals. Be prepared to abandon your hunt if a hunter needs help or you need to do an area check.

- Hunters are permitted to drive their vehicles within unrestricted areas to drop off/pick up their partners and to pick up field dressed deer. After the morning assembly and meeting at the parking lot with the VE's, the driving partner may drop off the other hunter and then return the car to the designated parking lot. VEs may allow the hunters to park in a location other than the assigned parking lot **only** with prior approval of the CRJMTC Hunt Coordinator. VE's are required to keep tabs on the vehicle to make sure the hunters are not out joy riding. Only VE's and hunters assigned to an igloo area are permitted to take their vehicles into the assigned igloo area. Driving off-road is prohibited.

- VE's are not here to hunt for the hunters. VE's may NOT shoot a deer for a hunter. VE's may gut and drag deer if they choose, but VE's are not required to do this as part of their volunteer service.

- VE's are not required but may haul deer for hunters. VE's would be expected to pick up a hunter along the roadside take them back to their vehicle so they could then to go pick up their own deer.

- Hunters found violating CRJMTC or ODOW hunting regulations will be brought to the attention of the CRJMTC Hunt Coordinator. Safety violations will result in the expulsion of the hunter and his partner. The VE will not remove the hunter, but escort him/her to building 1067 and contact the CRJMTC Hunt Coordinator.

- VE's are permitted to hunt during all hunts. Up to two deer may be taken in one day. Only one antlered deer may be taken per year. The total number of deer that may be taken by VE's is in accordance with Ohio regulations and the agreement between the ODOW and the OHARNG. VE's must have a valid Ohio Hunting License and deer tags. **VE's unable to hunt the perimeter of their areas are permitted to hunt in Group 1-A, Group 7 (hunt area 13A north of Smalley Rd.), between South Service Rd. and South Perimeter Rd. from George Rd Sewage to Load Line 2 Road (excluding the No Hunting Zone along SR 5), hunt areas 29C, 36A, 40A, and 44A, and along the boundary of their assigned hunt areas.**

- No VE has exclusive hunting privileges in the VE hunting areas. When open for hunting, VE coordinators will be assigned to these areas to ensure safety and manage the hunting pressure. **A sign in sheet for the area south of South Service Road will be in building 1067 (registration building)**. VE's are expected to hunt within close proximity to their assigned hunting areas. VE's must coordinate and cooperate with each other in the field so that areas are safely hunted and the VE's know where each other are hunting. VE's are not permitted to drive around post to sightsee. Only CRJMTC and security personnel are permitted to roam the installation.

- **Organized deer drives are not permitted**. Under no circumstance may VE's ask their hunters to push deer for or with them. Under no circumstances may VE's modify the boundaries of a designated hunting area or combine hunters into a single area for the sake of moving deer or to free up a hunting area for themselves or someone else not assigned to the area.

- Safety is a primary concern of the CRJMTC. We are concerned with the safety of the surrounding community, the hunters, the VE's, and other personnel working during the hunts. There is a 100' (1,200' around the Charlestown area and 600' in selected other areas) NO HUNTING zone around the entire southern and western perimeter and portions of the northern perimeter of the installation. Under no circumstances may a weapon be discharged into the NO HUNTING zone or in the direction of the perimeter fence by a VE or a hunter. No one except approved CRJMTC staff are permitted in the No Hunting Zone around the Demolition Area and/or the Burning Grounds. VE's are not permitted to track deer within the Demolition Area No Hunting Zone or the Burning Grounds. There are Safety Zones around all buildings, trailers, box cars, and equipment. Shooting is not permitted toward any of these items or into No Hunting Areas. Shooting is not permitted through any fence or across any road. We are very serious about keeping these hunts safe for our neighbors. Tell your hunters NOT to shoot toward the perimeter fence!! VE's are permitted to walk through the perimeter fence No Hunting zone in order to move deer, but discharge of firearms is not permitted within this area. Any area demarcated with Siebert stakes is a No Hunting zone and access is prohibited. All Load Lines, Wet Storage, other designated areas, and hunt areas not assigned or adjacent to a VE are No Hunting zones.

- If you come across anything that looks like a projectile or piece of UXO**, DO NOT PICK IT UP!!!** Put a flag by the location so it can be found again, walk out the way you came in, and tell the CRJMTC Hunt Coordinator.

- The CRJMTC staff will manage military hunters assigned to restricted areas. All hunters (military and general public) are required to stay within their assigned hunting area unless moved

or escorted by a VE or CRJMTC staff. VE's may switch hunters around in their hunt areas if areas are vacated and the hunters voluntarily want to switch.

- Neither VE's, hunters, nor the CRJMTC staff are permitted to remove anything but legally tagged deer from the CRJMTC. Do not pick up or disturb anything you find in the field including antlers, animal remains, bottles, old dump site items, etc. Stay out of all buildings except building 1067.

- You are responsible for calling in and registering the deer you harvest in accordance with Ohio DOW procedures and regulations. The Camp Ravenna staff and DOW will collect biological data on all harvested deer at building 1067. All VE's must cooperate with the DOW and support the job they are doing. Vehicles are not permitted to block the overhead door or create congestion at the building.

- Before leaving the CRJMTC VE's must sign out at building 1067. The dashboard pass must be verified at the sign-out table prior to leaving the CRJMTC after each hunt. The verified pass must be shown to the Post 1 security guard to facilitate egress. **VE's must sign their own time out at the end of the day on the VE roster.**

- There are no emergency response services at the CRJMTC. If emergency responders are called out to the CRJMTC for a VE or hunter, the person who receives the service is responsible for paying the cost. All calls for emergency assistance shall be made to Range Control at **614-336-6041 or the assigned Camp Ravenna Hunt Coordinator if Range Control is not available**. Range Control will call emergency responders and Camp Ravenna will provide an escort to your area.

Camp Ravenna Joint Military Training Center
Application for Deer Hunt Escort

Please print or type all answers. Date:_____

Name:_____

Address:_____

Home Phone:_____ Cell Phone:_____

e-mail address:_____

Please check one of the below classifications:

_____ Active Duty Military (Includes full-time Reserve or National Guard on active duty.)

_____ Department of Defense Civilian Employee

_____ Military Retiree

_____ DOD Civilian Retiree

_____ Reserve or National Guard other than above

_____ Camp Ravenna full time employee

_____ General Public

Describe your association with Camp Ravenna and/or experience that helps qualify you as a deer hunt escort. _____
_____
_____
_____
_____
_____
_____
_____

Personal References:

Name: _____ Phone: _____

Name: _____ Phone: _____

All non-military/DOD/badge carrying employees may be required to have an Ohio Bureau of Criminal Investigation (BCI) background check completed by the Sheriff of your county of residence. Individuals with felony convictions are not eligible as escorts.

Hunts are on Saturdays. Escorts must be available to work from 5:00 a.m. to 6:00 p.m. for every hunt. The number of hunts is determined each spring. There are usually between four and six hunts per year in October and November. Occasionally hunts will go into December. Escorts are expected to work all hunts, unless there are extenuating circumstances. Escorts will be permitted to hunt in accordance with Camp Ravenna and Ohio rules and regulations, if they have appropriate deer tags. The Camp Ravenna Garrison Commander will approve all escorts and service will be in accordance with the latest Camp Ravenna Volunteer Escort Program Information.

Camp Ravenna Joint Military Training Center
Gratuitous Service and
Release and Indemnity Agreement

I, _____, offer my services as an escort for the Camp Ravenna
(Print Your Name)
Joint Military Training Center (CRJMTC) deer hunting program. I expressly agree that my services are being performed gratuitously, and that I am not, solely because of these services, considered an employee of the United States Government or the State of Ohio or any instrumentality thereof. I expressly agree that I neither expect nor will I demand any present or future salary, wages, or related benefits as payment for these gratuitous services. I understand that I am permitted to participate in deer hunting at the CRJMTC in accordance with the National Guard Bureau (NGB) and Ohio Army National Guard (OHARNG) policies on volunteer participation. I agree to participate in whatever training that may be required in order for me to perform the work I have offered to do.

In consideration of being permitted to hunt on the grounds of CRJMTC, I do hereby for myself, my legal representatives, heirs, and assigns forever release and agree to hold harmless the United States Army, NGB, OHARNG, the Ohio Division of Wildlife and the officers and employees of all the aforementioned, and CRJMTC appointed gratuitous escorts ("releasees"), from any liability for personal injury or death or property damage that I may suffer during my presence at CRJMTC whether caused by releasees or otherwise.

I agree to indemnify and hold harmless the releasees from any loss, liability, damages, or costs which they may incur as a result of my acts or omissions. I also understand and agree that I may be held liable for any damages or loss to the releasees or others that is caused by my gross negligence, willful misconduct or fraud.

I expressly agree that this Release and Indemnity Agreement is intended to be as broad and inclusive as permitted by the laws of the State of Ohio.

_____
Printed Name of Individual
Offering Services

_____ _____
Signature of Individual Date
Offering Services

Volunteer Escort Certification and Training Verification Form

To be completed by all volunteer escorts participating in volunteer activity at Camp Ravenna Joint Military Training Center (CRJMTC).

Complete certification statement by reading the below statements and filling in the personal information. Indicate your concurrence with your signature and date.

I certify under penalty of perjury that:

A. I am not a fugitive from justice.
B. I am not under indictment for or been convicted of a felony offense of violence.
C. I am not under indictment for or been convicted of any offense involving illegal possession, use, sale, administration, distribution or trafficking in any drug of abuse.
D. I am not drug dependent, in danger of being drug dependent, or a chronic alcoholic.
E. I am not currently adjudged mentally incompetent.
F. I have not been adjudicated a juvenile delinquent because of an offense described in paragraphs B and C above.
G. I have not been convicted of a misdemeanor offense of domestic violence.
H. I have read the regulations for the CRJMTC Deer Hunt.
I. I have possession of a valid hunting license and deer permit(s).

I acknowledge that I am aware that there are no emergency medical facilities at the CRJMTC and if I require emergency medical attention a local EMS will be notified and I am responsible for the cost.

I acknowledge that as a volunteer I am not an employee of the United States government or the State of Ohio and am not entitled to any rights, privileges, benefits, or compensation afforded to said employees.

I acknowledge that I have attended volunteer escort training on the date show below.

_____
Printed Name

_____
Street Address City State Zip

Home Phone: _____ Cell: _____

Email: _____

Emergency Contact Name: _____ Phone: _____

_____ _____
Signature Date

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APPENDIX J

CAMP RAVENNA FEDERALLY PROTECTED SPECIES MANAGEMENT GUIDANCE

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Camp Ravenna Bald Eagle Management Guidance

In 2010, a nesting pair of the federally protected bald eagle (*Haliaeetus leucocephalus*) was discovered in a snag tree within a large wetland at Camp Ravenna Joint Military Training Center in Portage County, Ohio. Upon its discovery, the Environmental Office at Camp Ravenna began working with Army staff to enforce USFWS guidelines for bald-eagle management in the area in which it was found, which happened to be within a land-navigation course as well as training line of flight used by the United States Air Force. The bald eagles at Camp Ravenna demonstrate a tolerant nature to military training activity. They established their nest in close proximity to both aviation and land based training activity to include the use of pyrotechnic grenade and improvised explosive devises within a half mile radius of the nest. The birds also successfully reared young every year except for their first year. The tolerant nature of the bald eagles allows Camp Ravenna some flexibility in implementing off-limits and other management zones and has resulted in only minor impacts on the training mission.

The bald eagles are managed in accordance with all relevant Federal and State laws and DoD Directives. The primary guide for Bald Eagle Management implemented by the OHARNG at Camp Ravenna is the May 2007 USFWS National Bald Eagle Management Guidelines and Tolerance Level of the Bald Eagles. The guidance set forth by the USFWS, and followed at Camp Ravenna, includes restricted areas completely surrounding the bald eagle nest east of Greenleaf Road. Per USFWS guidance, no person is permitted within 660 feet of the active nest from 1 DEC to 31 AUG which means that all ground activity is prohibited within this set perimeter during said time period. Aircraft over-flight within 700 horizontal and vertical feet is prohibited from 1 DEC to 31 AUG provided that the eagles are not disturbed whereas aircraft over-flight within 330 feet from 1 SEP to 30 NOV is permitted so long as this activity does not disturb the eagles. All ground training activity is prohibited within 330 feet of the nest year-round. See Figure 1, Camp Ravenna Bald Eagle Land Use Restriction Map for diagram of restricted areas.

To reduce the risk of the bald eagle nest being inadvertently disturbed, two way-point markers were relocated and year-round buffer restrictions were put in place to prevent unauthorized personnel from entering within 330 feet of the nest. To ensure further protection for the breeding pair of bald eagles, all access within 1,000 feet of the nest must be pre-approved by the Camp Ravenna Environmental office.

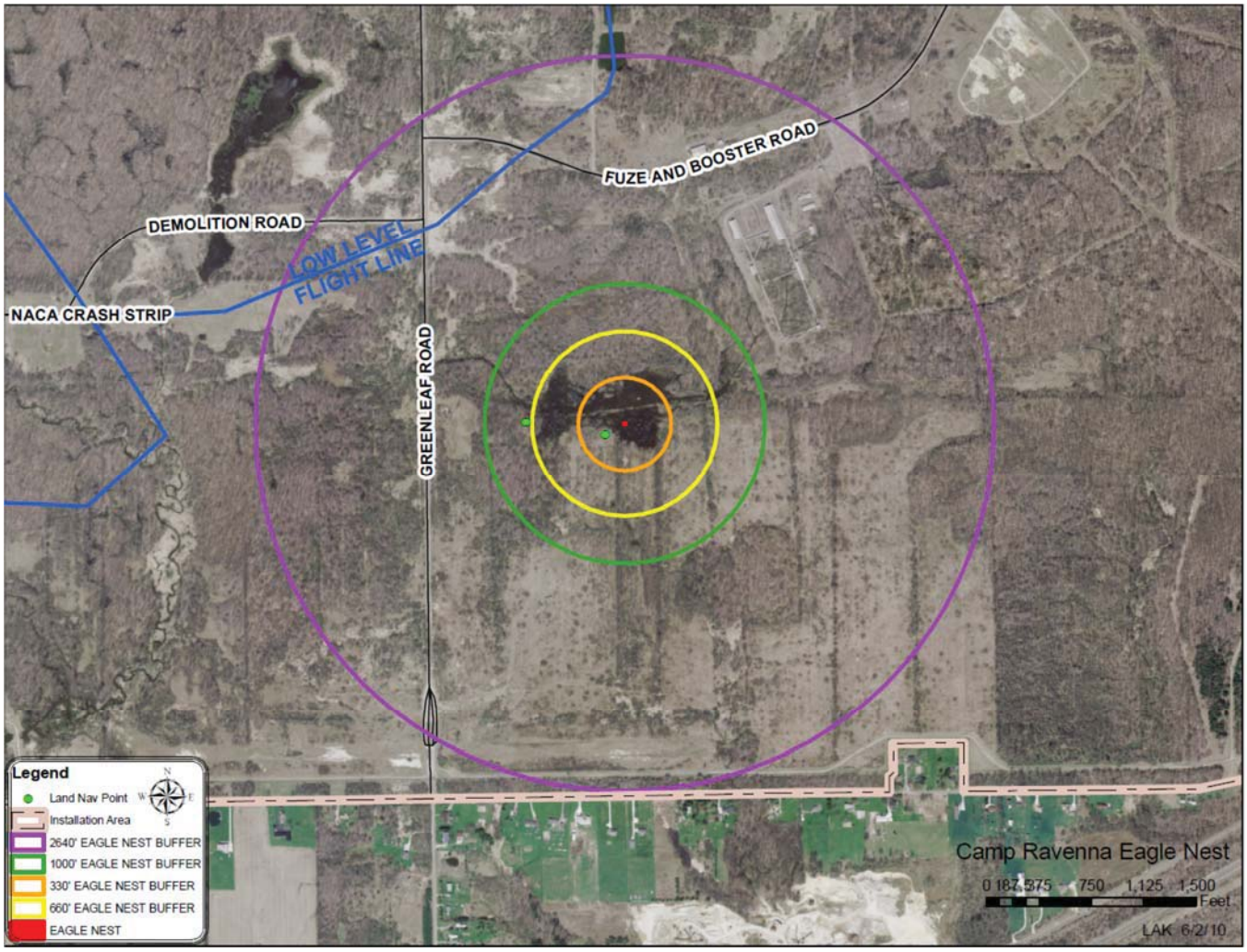
Other conservation strategies being implemented by the OHARNG to manage and protect the nesting bald eagles at Camp Ravenna include:

- Protect communal roost sites and retain some mature trees and stands within ½ mile of known nest.
- Avoid potentially disruptive activities and development in the eagles' direct flight path between their nest and roost sites and preferred foraging areas.
- Avoid recreational boating and fishing near eagle nest and local foraging area.
- Using all pesticides, herbicides and other chemicals in accordance with federal and state laws and labeled instructions.
- If nest is blown out of inhabited tree(s), or are otherwise destroyed by the elements, the OHARNG will continue to protect the site in the absence of the nest for up to three complete breeding seasons.
- Avoiding contact with (including feeding) bald eagles, including those that may be found injured anywhere on site.
- Adhering as best as possible to the USFWS' *National Bald Eagle Management Guidelines* (May 2007) while supporting military training operations and INRMP implementation.

Despite our best conservation efforts, if any activity conducted at Camp Ravenna is found to be adversely affecting the breeding bald eagles and their protected nesting area, the OHARNG will consult with the USFWS.

For more information regarding the biology of bald eagles, their current status in Ohio, and the nesting pair at Camp Ravenna, see Section 6.4.1.1. of the Camp Ravenna Integrated Natural Resources Management Plan.

Figure 1: Camp Ravenna Bald Eagle Land Use Restriction Map



LEGEND:

RED DOT = Location of bald eagle nest. GREEN DOTS = Land Navigation Course waypoint (relocated since discovery of bald eagle nest). ORANGE CIRCLE = 330 feet radius surrounding bald eagle nest. Access within this perimeter is strictly prohibited year-round. YELLOW CIRCLE = 660 feet radius surrounding bald eagle nest. Access within this perimeter is strictly prohibited 1 DEC – 31 AUG. GREEN CIRCLE = 1000-foot buffer surrounding bald eagle nest. Access within this perimeter must be pre-approved by the CRJMTC Environmental Supervisor. PINK CIRCLE = Loud Noise (pyro, explosives, intense blank small arms exchanges) prohibited within 1/2 mile surrounding bald eagle nest from 1 DEC – 31 AUG.

Aircraft overflight within 700 feet (horizontal and vertical) strictly prohibited from 1 DEC to 31 AUG. Aircraft overflight within 330 feet is permitted from 1 SEP to 30 NOV so long as this activity does not disturb the eagles.

The Environmental office may expand the buffers if the eagles are disturbed or reduced them if the eagles are shown to tolerate ground and aviation activities.

National Bald Eagle Management Guidelines

NATIONAL BALD EAGLE MANAGEMENT GUIDELINES

U.S. Fish and Wildlife Service

May 2007

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INTRODUCTION

The bald eagle (*Haliaeetus leucocephalus*) is protected by the Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act (MBTA). The MBTA and the Eagle Act protect bald eagles from a variety of harmful actions and impacts. The U.S. Fish and Wildlife Service (Service) developed these National Bald Eagle Management Guidelines to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the Eagle Act may apply to their activities. A variety of human activities can potentially interfere with bald eagles, affecting their ability to forage, nest, roost, breed, or raise young. The Guidelines are intended to help people minimize such impacts to bald eagles, particularly where they may constitute "disturbance," which is prohibited by the Eagle Act.

The Guidelines are intended to:

(1) Publicize the provisions of the Eagle Act that continue to protect bald eagles, in order to reduce the possibility that people will violate the law,

(2) Advise landowners, land managers and the general public of the potential for various human activities to disturb bald eagles, and

(3) Encourage additional nonbinding land management practices that benefit bald eagles (see Additional Recommendations section).

While the Guidelines include general recommendations for land management practices that will benefit bald eagles, the document is intended primarily as a tool for landowners and planners who seek information and recommendations regarding how to avoid disturbing bald eagles. Many States and some tribal entities have developed state-specific management plans, regulations, and/or guidance for landowners and land managers to protect and enhance bald eagle habitat, and we encourage the continued development and use of these planning tools to benefit bald eagles.

Adherence to the Guidelines herein will benefit individuals, agencies, organizations, and companies by helping them avoid violations of the law. However, the Guidelines themselves are not law. Rather, they are recommendations based on several decades of behavioral observations, science, and conservation measures to avoid or minimize adverse impacts to bald eagles.

The U.S. Fish and Wildlife Service strongly encourages adherence to these guidelines to ensure that bald and golden eagle populations will continue to be sustained. The Service realizes there may be impacts to some birds even if all reasonable measures are taken to avoid such impacts. Although it is not possible to absolve individuals and entities from liability under the Eagle Act or the MBTA, the Service exercises enforcement discretion to focus on those individuals, companies, or agencies that take migratory birds without regard for the consequences of their actions and the law, especially when conservation measures, such as these Guidelines, are available, but have not been implemented. The Service will prioritize its enforcement efforts to focus on those individuals or entities who take bald eagles or their parts, eggs, or nests without implementing appropriate measures recommended by the Guidelines.

The Service intends to pursue the development of regulations that would authorize, under limited circumstances, the use of permits if “take” of an eagle is anticipated but unavoidable. Additionally, if the bald eagle is delisted, the Service intends to provide a regulatory mechanism to honor existing (take) authorizations under the Endangered Species Act (ESA).

During the interim period until the Service completes a rulemaking for permits under the Eagle Act, the Service does not intend to refer for prosecution the incidental “*take*” of any bald eagle under the MBTA or Eagle Act, if such take is in full compliance with the terms and conditions of an incidental take statement issued to the action agency or applicant under the authority of section 7(b)(4) of the ESA or a permit issued under the authority of section 10(a)(1)(B) of the ESA.

The Guidelines are applicable throughout the United States, including Alaska. The primary purpose of these Guidelines is to provide information that will minimize or prevent violations only of *Federal* laws governing bald eagles. In addition to Federal laws, many states and some smaller jurisdictions and tribes have additional laws and regulations protecting bald eagles. In some cases those laws and regulations may be more protective (restrictive) than these Federal guidelines. If you are planning activities that may affect bald eagles, we therefore recommend that you contact both your nearest U.S. Fish and Wildlife Service Field Office (see the contact information on p.16) and your state wildlife agency for assistance.

LEGAL PROTECTIONS FOR THE BALD EAGLE

The Bald and Golden Eagle Protection Act

The Eagle Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald eagles, including their parts, nests, or eggs. The Act provides criminal and civil penalties for persons who “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof.” The Act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” “Disturb’’ means:

> "Disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle=s return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

A violation of the Act can result in a criminal fine of $100,000 ($200,000 for organizations), imprisonment for one year, or both, for a first offense. Penalties increase substantially for additional offenses, and a second violation of this Act is a felony.

The Migratory Bird Treaty Act
The MBTA (16 U.S.C. 703-712), prohibits the taking of any migratory bird or any part, nest, or egg, except as permitted by regulation. The MBTA was enacted in 1918; a 1972 agreement supplementing one of the bilateral treaties underlying the MBTA had the effect of expanding the scope of the Act to cover bald eagles and other raptors. Implementing regulations define "take" under the MBTA as "pursue, hunt, shoot, wound, kill, trap, capture, possess, or collect."

Copies of the Eagle Act and the MBTA are available at: http://permits.fws.gov/ltr/ltr.shtml.

State laws and regulations
Most states have their own regulations and/or guidelines for bald eagle management. Some states may continue to list the bald eagle as endangered, threatened, or of special concern. If you plan activities that may affect bald eagles, we urge you to familiarize yourself with the regulations and/or guidelines that apply to bald eagles in your state. Your adherence to the Guidelines herein does not ensure that you are in compliance with state laws and regulations because state regulations can be more specific and/or restrictive than these Guidelines.

NATURAL HISTORY OF THE BALD EAGLE

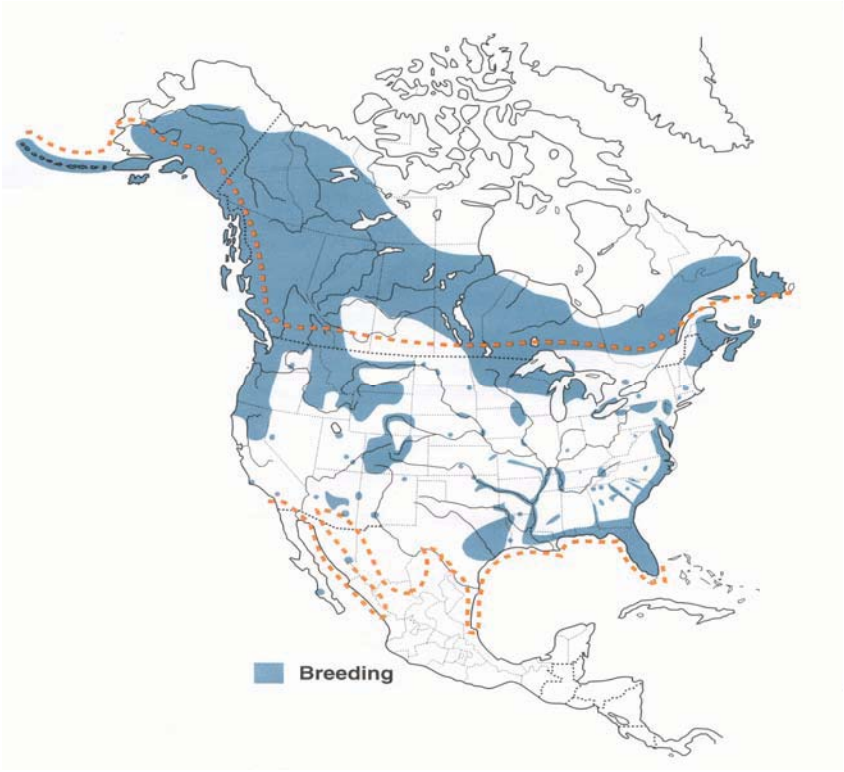
Bald eagles are a North American species that historically occurred throughout the contiguous United States and Alaska. After severely declining in the lower 48 States between the 1870s and the 1970s, bald eagles have rebounded and re-established breeding territories in each of the lower 48 states. The largest North American breeding populations are in Alaska and Canada, but there are also significant bald eagle populations in Florida, the Pacific Northwest, the Greater Yellowstone area, the Great Lakes states, and the Chesapeake Bay region. Bald eagle distribution varies seasonally. Bald eagles that nest in southern latitudes frequently move northward in late spring and early summer, often summering as far north as Canada. Most eagles that breed at northern latitudes migrate southward during winter, or to coastal areas where waters remain unfrozen. Migrants frequently concentrate in large numbers at sites where food is abundant and they often roost together communally. In some cases, concentration areas are used year-round: in summer by southern eagles and in winter by northern eagles.

Juvenile bald eagles have mottled brown and white plumage, gradually acquiring their dark brown body and distinctive white head and tail as they mature. Bald eagles generally attain adult plumage by 5 years of age. Most are capable of breeding at 4 or 5 years of age, but in healthy populations they may not start breeding until much older. Bald eagles may live 15 to 25 years in the wild. Adults weigh 8 to 14 pounds (occasionally reaching 16 pounds in Alaska) and have wingspans of 5 to 8 feet. Those in the northern range are larger than those in the south, and females are larger than males.

Where do bald eagles nest?

Breeding bald eagles occupy "territories," areas they will typically defend against intrusion by other eagles. In addition to the active nest, a territory may include one or more alternate nests (nests built or maintained by the eagles but not used for nesting in a given year). The Eagle Act prohibits removal or destruction of both active and alternate bald eagle nests. Bald eagles exhibit high nest site fidelity and nesting territories are often used year after year. Some territories are known to have been used continually for over half a century.

Bald eagles generally nest near coastlines, rivers, large lakes or streams that support an adequate food supply. They often nest in mature or old-growth trees; snags (dead trees); cliffs; rock promontories; rarely on the ground; and with increasing frequency on human-made structures such as power poles and communication towers. In forested areas, bald eagles often select the tallest trees with limbs strong enough to support a nest that can weigh more than 1,000 pounds. Nest sites typically include at least one perch with a clear view of the water where the eagles usually forage. Shoreline trees or snags located in reservoirs provide the visibility and accessibility needed to locate aquatic prey. Eagle nests are constructed with large sticks, and may be lined with moss, grass, plant stalks, lichens, seaweed, or sod. Nests are usually about 4-6 feet in diameter and 3 feet deep, although larger nests exist.



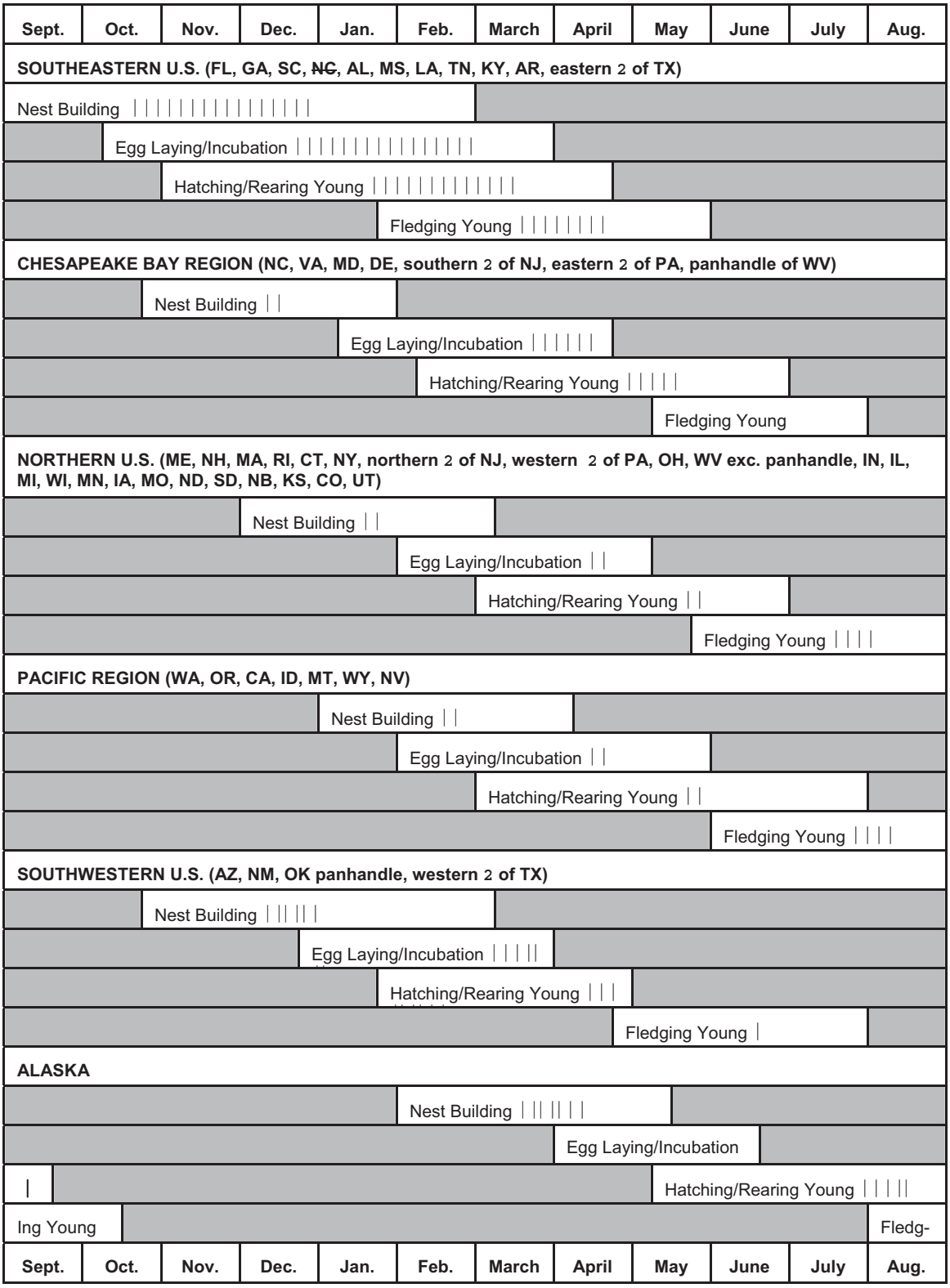
The range of breeding bald eagles in 2000 (shaded areas). This map shows only the larger concentrations of nests; eagles have continued to expand into additional nesting territories in many states. The dotted line represents the bald eagle's wintering range.

When do bald eagles nest?

Nesting activity begins several months before egg-laying. Egg-laying dates vary throughout the U.S., ranging from October in Florida, to late April or even early May in the northern United States. Incubation typically lasts 33-35 days, but can be as long as 40 days. Eaglets make their first unsteady flights about 10 to 12 weeks after hatching, and fledge (leave their nests) within a few days after that first flight. However, young birds usually remain in the vicinity of the nest for several weeks after fledging because they are almost completely dependent on their parents for food until they disperse from the nesting territory approximately 6 weeks later.

The bald eagle breeding season tends to be longer in the southern U.S., and re-nesting following an unsuccessful first nesting attempt is more common there as well. The following table shows the timing of bald eagle breeding seasons in different regions of the country. The table represents the range of time within which the majority of nesting activities occur in each region and does not apply to any specific nesting pair. Because the timing of nesting activities may vary within a given region, you should contact the nearest U.S. Fish and Wildlife Service Field Office (see page 16) and/or your state wildlife conservation agency for more specific information on nesting chronology in your area.

Chronology of typical reproductive activities of bald eagles in the United States.



How many chicks do bald eagles raise?
The number of eagle eggs laid will vary from 1-3, with 1-2 eggs being the most common. Only one eagle egg is laid per day, although not always on successive days. Hatching of young occurs on different days with the result that chicks in the same nest are sometimes of unequal size. The overall national fledging rate is approximately one chick per nest, annually, which results in a healthy expanding population.

What do bald eagles eat?
Bald eagles are opportunistic feeders. Fish comprise much of their diet, but they also eat waterfowl, shorebirds/colonial waterbirds, small mammals, turtles, and carrion. Because they are visual hunters, eagles typically locate their prey from a conspicuous perch, or soaring flight, then swoop down and strike. Wintering bald eagles often congregate in large numbers along streams to feed on spawning salmon or other fish species, and often gather in large numbers in areas below reservoirs, especially hydropower dams, where fish are abundant. Wintering eagles also take birds from rafts of ducks at reservoirs and rivers, and congregate on melting ice shelves to scavenge dead fish from the current or the soft melting ice. Bald eagles will also feed on carcasses along roads, in landfills, and at feedlots.

During the breeding season, adults carry prey to the nest to feed the young. Adults feed their chicks by tearing off pieces of food and holding them to the beaks of the eaglets. After fledging, immature eagles are slow to develop hunting skills, and must learn to locate reliable food sources and master feeding techniques. Young eagles will congregate together, often feeding upon easily acquired food such as carrion and fish found in abundance at the mouths of streams and shallow bays and at landfills.

The impact of human activity on nesting bald eagles
During the breeding season, bald eagles are sensitive to a variety of human activities. However, not all bald eagle pairs react to human activities in the same way. Some pairs nest successfully just dozens of yards from human activity, while others abandon nest sites in response to activities much farther away. This variability may be related to a number of factors, including visibility, duration, noise levels, extent of the area affected by the activity, prior experiences with humans, and tolerance of the individual nesting pair. The relative sensitivity of bald eagles during various stages of the breeding season is outlined in the following table.

Nesting Bald Eagle Sensitivity to Human Activities

Phase	Activity	Sensitivity to Human Activity	Comments
I	Courtship and Nest Building	Most sensitive period; likely to respond negatively	Most critical time period. Disturbance is manifested in nest abandonment. Bald eagles in newly established territories are more prone to abandon nest sites.
II	Egg laying	Very sensitive period	Human activity of even limited duration may cause nest desertion and abandonment of territory for the breeding season.
III	Incubation and early nestling period (up to 4 weeks)	Very sensitive period	Adults are less likely to abandon the nest near and after hatching. However, flushed adults leave eggs and young unattended; eggs are susceptible to cooling, loss of moisture, overheating, and predation; young are vulnerable to elements.
IV	Nestling period, 4 to 8 weeks	Moderately sensitive period	Likelihood of nest abandonment and vulnerability of the nestlings to elements somewhat decreases. However, nestlings may miss feedings, affecting their survival.
V	Nestlings 8 weeks through fledging	Very sensitive period	Gaining flight capability, nestlings 8 weeks and older may flush from the nest prematurely due to disruption and die.

If agitated by human activities, eagles may inadequately construct or repair their nest, may expend energy defending the nest rather than tending to their young, or may abandon the nest altogether. Activities that cause prolonged absences of adults from their nests can jeopardize eggs or young. Depending on weather conditions, eggs may overheat or cool too much and fail to hatch. Unattended eggs and nestlings are subject to predation. Young nestlings are particularly vulnerable because they rely on their parents to provide warmth or shade, without which they may die as a result of hypothermia or heat stress. If food delivery schedules are interrupted, the young may not develop healthy plumage, which can affect their survival. In addition, adults startled while incubating or brooding young may damage eggs or injure their young as they abruptly leave the nest. Older nestlings no longer require constant attention from the adults, but they may be startled by loud or intrusive human activities and prematurely jump from the nest before they are able to fly or care for themselves. Once fledged, juveniles range up to ¼ mile from the nest site, often to a site with minimal human activity. During this period, until about six weeks after departure from the nest, the juveniles still depend on the adults to feed them.

The impact of human activity on foraging and roosting bald eagles

Disruption, destruction, or obstruction of roosting and foraging areas can also negatively affect bald eagles. Disruptive activities in or near eagle foraging areas can interfere with feeding, reducing chances of survival. Interference with feeding can also result in reduced productivity (number of young successfully fledged). Migrating and wintering bald eagles often congregate at specific sites for purposes of feeding and sheltering. Bald eagles rely on established roost sites because of their proximity to sufficient food sources. Roost sites are usually in mature trees where the eagles are somewhat sheltered from the wind and weather. Human activities near or within communal roost sites may prevent eagles

from feeding or taking shelter, especially if there are not other undisturbed and productive feeding and roosting sites available. Activities that permanently alter communal roost sites and important foraging areas can altogether eliminate the elements that are essential for feeding and sheltering eagles.

Where a human activity agitates or bothers roosting or foraging bald eagles to the degree that causes injury or substantially interferes with breeding, feeding, or sheltering behavior and causes, or is likely to cause, a loss of productivity or nest abandonment, the conduct of the activity constitutes a violation of the Eagle Act's prohibition against disturbing eagles. The circumstances that might result in such an outcome are difficult to predict without detailed site-specific information. If your activities may disturb roosting or foraging bald eagles, you should contact your local Fish and Wildlife Service Field Office (see page 16) for advice and recommendations for how to avoid such disturbance.

RECOMMENDATIONS FOR AVOIDING DISTURBANCE AT NEST SITES

In developing these Guidelines, we relied on existing state and regional bald eagle guidelines, scientific literature on bald eagle disturbance, and recommendations of state and Federal biologists who monitor the impacts of human activity on eagles. Despite these resources, uncertainties remain regarding the effects of many activities on eagles and how eagles in different situations may or may not respond to certain human activities. The Service recognizes this uncertainty and views the collection of better biological data on the response of eagles to disturbance as a high priority. To the extent that resources allow, the Service will continue to collect data on responses of bald eagles to human activities conducted according to the recommendations within these Guidelines to ensure that adequate protection from disturbance is being afforded, and to identify circumstances where the Guidelines might be modified. These data will be used to make future adjustments to the Guidelines.

To avoid disturbing nesting bald eagles, we recommend (1) keeping a distance between the activity and the nest (distance buffers), (2) maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees.

The size and shape of effective buffers vary depending on the topography and other ecological characteristics surrounding the nest site. In open areas where there are little or no forested or topographical buffers, such as in many western states, distance alone must serve as the buffer. Consequently, in open areas, the distance between the activity and the nest may need to be larger than the distances recommended under Categories A and B of these guidelines (pg. 12) if no landscape buffers are present. The height of the nest above the ground may also ameliorate effects of human activities; eagles at higher nests may be less prone to disturbance.

In addition to the physical features of the landscape and nest site, the appropriate size for the distance buffer may vary according to the historical tolerances of eagles to human activities in particular localities, and may also depend on the location of the nest in relation

to feeding and roosting areas used by the eagles. Increased competition for nest sites may lead bald eagles to nest closer to human activity (and other eagles).

Seasonal restrictions can prevent the potential impacts of many shorter-term, obtrusive activities that do not entail landscape alterations (e.g. fireworks, outdoor concerts). In proximity to the nest, these kinds of activities should be conducted only outside the breeding season. For activities that entail both short-term, obtrusive characteristics and more permanent impacts (e.g., building construction), we recommend a combination of both approaches: retaining a landscape buffer *and* observing seasonal restrictions.

For assistance in determining the appropriate size and configuration of buffers or the timing of activities in the vicinity of a bald eagle nest, we encourage you to contact the nearest U.S. Fish and Wildlife Service Field Office (see page 16).

Existing Uses

Eagles are unlikely to be disturbed by routine use of roads, homes, and other facilities where such use pre-dates the eagles' successful nesting activity in a given area. Therefore, in most cases *ongoing* existing uses may proceed with the same intensity with little risk of disturbing bald eagles. However, some *intermittent, occasional, or irregular* uses that pre-date eagle nesting in an area may disturb bald eagles. For example: a pair of eagles may begin nesting in an area and subsequently be disturbed by activities associated with an annual outdoor flea market, even though the flea market has been held annually at the same location. In such situations, human activity should be adjusted or relocated to minimize potential impacts on the nesting pair.

ACTIVITY-SPECIFIC GUIDELINES

The following section provides the Service=s management recommendations for avoiding bald eagle disturbance as a result of new or intermittent activities proposed in the vicinity of bald eagle nests. Activities are separated into 8 categories (A – H) based on the nature and magnitude of impacts to bald eagles that usually result from the type of activity. Activities with similar or comparable impacts are grouped together.

In most cases, impacts will vary based on the visibility of the activity from the eagle nest and the degree to which similar activities are already occurring in proximity to the nest site. Visibility is a factor because, in general, eagles are more prone to disturbance when an activity occurs in full view. For this reason, we recommend that people locate activities farther from the nest structure in areas with open vistas, in contrast to areas where the view is shielded by rolling topography, trees, or other screening factors. The recommendations also take into account the existence of similar activities in the area because the continued presence of nesting bald eagles in the vicinity of the existing activities indicates that the eagles in that area can tolerate a greater degree of human activity than we can generally expect from eagles in areas that experience fewer human impacts. To illustrate how these factors affect the likelihood of disturbing eagles, we have incorporated the recommendations for some activities into a table (categories A and B).

First, determine which category your activity falls into (between categories A – H). If the activity you plan to undertake is not specifically addressed in these guidelines, follow the recommendations for the most similar activity represented.

If your activity is under A or B, our recommendations are in table form. The vertical axis shows the degree of visibility of the activity from the nest. The horizontal axis (header row) represents the degree to which similar activities are ongoing in the vicinity of the nest. Locate the row that best describes how visible your activity will be from the eagle nest. Then, choose the column that best describes the degree to which similar activities are ongoing in the vicinity of the eagle nest. The box where the column and row come together contains our management recommendations for how far you should locate your activity from the nest to avoid disturbing the eagles. The numerical distances shown in the tables are the closest the activity should be conducted relative to the nest. In some cases we have included additional recommendations (other than recommended *distance* from the nest) you should follow to help ensure that your activity will not disturb the eagles.

Alternate nests

For activities that entail permanent landscape alterations that may result in bald eagle disturbance, these recommendations apply to both active and alternate bald eagle nests. Disturbance becomes an issue with regard to alternate nests if eagles return for breeding purposes and react to land use changes that occurred while the nest was inactive. The likelihood that an alternate nest will again become active decreases the longer it goes unused. If you plan activities in the vicinity of an alternate bald eagle nest and have information to show that the nest has not been active during the preceding 5 breeding seasons, the recommendations provided in these guidelines for avoiding disturbance around the nest site may no longer be warranted. The nest itself remains protected by other provisions of the Eagle Act, however, and may not be destroyed.

If special circumstances exist that make it unlikely an inactive nest will be reused before 5 years of disuse have passed, and you believe that the probability of reuse is low enough to warrant disregarding the recommendations for avoiding disturbance, you should be prepared to provide all the reasons for your conclusion, including information regarding past use of the nest site. Without sufficient documentation, you should continue to follow these guidelines when conducting activities around the nest site. If we are able to determine that it is unlikely the nest will be reused, we may advise you that the recommendations provided in these guidelines for avoiding disturbance are no longer necessary around that nest site.

This guidance is intended to minimize disturbance, as defined by Federal regulation. In addition to Federal laws, most states and some tribes and smaller jurisdictions have additional laws and regulations protecting bald eagles. In some cases those laws and regulations may be more protective (restrictive) than these Federal guidelines.

Temporary Impacts

For activities that have temporary impacts, such as the use of loud machinery, fireworks displays, or summer boating activities, we recommend seasonal restrictions. These types of activities can generally be carried out outside of the breeding season without causing disturbance. The recommended restrictions for these types of activities can be lifted for alternate nests within a particular territory, including nests that were attended during the current breeding season but not used to raise young, after eggs laid in another nest within the territory have hatched (depending on the distance between the alternate nest and the active nest).

In general, activities should be kept as far away from nest trees as possible; loud and disruptive activities should be conducted when eagles are not nesting; and activity between the nest and the nearest foraging area should be minimized. If the activity you plan to undertake is not specifically addressed in these guidelines, follow the recommendations for the most similar activity addressed, or contact your local U.S. Fish and Wildlife Service Field Office for additional guidance.

If you believe that special circumstances apply to your situation that increase or diminish the likelihood of bald eagle disturbance, or if it is not possible to adhere to the guidelines, you should contact your local Service Field Office for further guidance.

Category A:
Building construction, 1 or 2 story, with project footprint of ½ acre or less.
Construction of roads, trails, canals, power lines, and other linear utilities.
Agriculture and aquaculture – new or expanded operations.
Alteration of shorelines or wetlands.
Installation of docks or moorings.
Water impoundment.

Category B:
Building construction, 3 or more stories.
Building construction, 1 or 2 story, with project footprint of more than ½ acre.
Installation or expansion of marinas with a capacity of 6 or more boats.
Mining and associated activities.
Oil and natural gas drilling and refining and associated activities.

	If there is no similar activity within 1 mile of the nest	***If there is similar activity closer than 1 mile from the nest***
If the activity will be visible from the nest	660 feet. Landscape buffers are recommended.	660 feet, or as close as existing tolerated activity of similar scope. Landscape buffers are recommended.
If the activity will not be visible from the nest	Category A: 330 feet. Clearing, external construction, and landscaping between 330 feet and 660 feet should be done outside breeding season. Category B: 660 feet.	330 feet, or as close as existing tolerated activity of similar scope. Clearing, external construction and landscaping within 660 feet should be done outside breeding season.

The numerical distances shown in the table are the closest the activity should be conducted relative to the nest.

Category C. Timber Operations and Forestry Practices

- Avoid clear cutting or removal of overstory trees within 330 feet of the nest at any time.

- Avoid timber harvesting operations, including road construction and chain saw and yarding operations, during the breeding season within 660 feet of the nest. The distance may be decreased to 330 feet around alternate nests within a particular territory, including nests that were attended during the current breeding season but not used to raise young, after eggs laid in another nest within the territory have hatched.

- Selective thinning and other silviculture management practices designed to conserve or enhance habitat, including prescribed burning close to the nest tree, should be undertaken outside the breeding season. Precautions such as raking leaves and woody debris from around the nest tree should be taken to prevent crown fire or fire climbing the nest tree. If it is determined that a burn during the breeding season would be beneficial, then, to ensure that no take or disturbance will occur, these activities should be conducted only when neither adult eagles nor young are present at the nest tree (i.e., at the beginning of, or end of, the breeding season, either before the particular nest is active or after the young have fledged from that nest). Appropriate Federal and state biologists should be consulted before any prescribed burning is conducted during the breeding season.

- Avoid construction of log transfer facilities and in-water log storage areas within 330 feet of the nest.

Category D. Off-road vehicle use (including snowmobiles). No buffer is necessary around nest sites outside the breeding season. During the breeding season, do not operate off-road vehicles within 330 feet of the nest. In open areas, where there is increased visibility and exposure to noise, this distance should be extended to 660 feet.

Category E. Motorized Watercraft use (including jet skis/personal watercraft). No buffer is necessary around nest sites outside the breeding season. During the breeding season, within 330 feet of the nest, (1) do not operate jet skis (personal watercraft), and (2) avoid concentrations of noisy vessels (e.g., commercial fishing boats and tour boats), except where eagles have demonstrated tolerance for such activity. Other motorized boat traffic passing within 330 feet of the nest should attempt to minimize trips and avoid stopping in the area where feasible, particularly where eagles are unaccustomed to boat traffic. Buffers for airboats should be larger than 330 feet due to the increased noise they generate, combined with their speed, maneuverability, and visibility.

Category F. Non-motorized recreation and human entry (e.g., hiking, camping, fishing, hunting, birdwatching, kayaking, canoeing). No buffer is necessary around nest sites outside the breeding season. If the activity will be visible or highly audible from the nest, maintain a 330-foot buffer during the breeding season, particularly where eagles are unaccustomed to such activity.

Category G. Helicopters and fixed-wing aircraft.
Except for authorized biologists trained in survey techniques, avoid operating aircraft within 1,000 feet of the nest during the breeding season, except where eagles have demonstrated tolerance for such activity.

Category H. Blasting and other loud, intermittent noises.
Avoid blasting and other activities that produce extremely loud noises within 1/2 mile of active nests, unless greater tolerance to the activity (or similar activity) has been demonstrated by the eagles in the nesting area. This recommendation applies to the use of fireworks classified by the Federal Department of Transportation as Class B explosives, which includes the larger fireworks that are intended for licensed public display.

RECOMMENDATIONS FOR AVOIDING DISTURBANCE AT FORAGING AREAS AND COMMUNAL ROOST SITES

1. Minimize potentially disruptive activities and development in the eagles' direct flight path between their nest and roost sites and important foraging areas.

2. Locate long-term and permanent water-dependent facilities, such as boat ramps and marinas, away from important eagle foraging areas.

3. Avoid recreational and commercial boating and fishing near critical eagle foraging areas during peak feeding times (usually early to mid-morning and late afternoon), except where eagles have demonstrated tolerance to such activity.

4. Do not use explosives within ½ mile (or within 1 mile in open areas) of communal roosts when eagles are congregating, without prior coordination with the U.S. Fish and Wildlife Service and your state wildlife agency.

5. Locate aircraft corridors no closer than 1,000 feet vertical or horizontal distance from communal roost sites.

ADDITIONAL RECOMMENDATIONS TO BENEFIT BALD EAGLES

The following are additional management practices that landowners and planners can exercise for added benefit to bald eagles.

1. Protect and preserve potential roost and nest sites by retaining mature trees and old growth stands, particularly within ½ mile from water.

2. Where nests are blown from trees during storms or are otherwise destroyed by the elements, continue to protect the site in the absence of the nest for up to three (3) complete breeding seasons. Many eagles will rebuild the nest and reoccupy the site.

3. To avoid collisions, site wind turbines, communication towers, and high voltage transmission power lines away from nests, foraging areas, and communal roost sites.

4. Employ industry-accepted best management practices to prevent birds from colliding with or being electrocuted by utility lines, towers, and poles. If possible, bury utility lines in important eagle areas.

5. Where bald eagles are likely to nest in human-made structures (e.g., cell phone towers) and such use could impede operation or maintenance of the structures or jeopardize the safety of the eagles, equip the structures with either (1) devices engineered to discourage bald eagles from building nests, or (2) nesting platforms that will safely accommodate bald eagle nests without interfering with structure performance.

6. Immediately cover carcasses of euthanized animals at landfills to protect eagles from being poisoned.

7. Do not intentionally feed bald eagles. Artificially feeding bald eagles can disrupt their essential behavioral patterns and put them at increased risk from power lines, collision with windows and cars, and other mortality factors.

8. Use pesticides, herbicides, fertilizers, and other chemicals only in accordance with Federal and state laws.

9. Monitor and minimize dispersal of contaminants associated with hazardous waste sites (legal or illegal), permitted releases, and runoff from agricultural areas, especially within watersheds where eagles have shown poor reproduction or where bioaccumulating contaminants have been documented. These factors present a risk of contamination to eagles and their food sources.

CONTACTS

The following U.S. Fish and Wildlife Service Field Offices provide technical assistance on bald eagle management:

Alabama	Daphne	(251) 441-5181
Alaska	Anchorage	(907) 271-2888
	Fairbanks	(907) 456-0203
	Juneau	(907) 780-1160
Arizona	Phoenix	(602) 242-0210
Arkansas	Conway	(501) 513-4470
California	Arcata	(707) 822-7201
	Barstow	(760) 255-8852
	Carlsbad	(760) 431-9440
	Red Bluff	(530) 527-3043
	Sacramento	(916) 414-6000
	Stockton	(209) 946-6400
	Ventura	(805) 644-1766
	Yreka	(530) 842-5763
Colorado	Lakewood	(303) 275-2370
	Grand Junction	(970) 243-2778
Connecticut	(See New Hampshire)	
Delaware	(See Maryland)	
Florida	Panama City	(850) 769-0552
	Vero Beach	(772) 562-3909
	Jacksonville	(904) 232-2580
Georgia	Athens	(706) 613-9493
	Brunswick	(912) 265-9336
	Columbus	(706) 544-6428
Idaho	Boise	(208) 378-5243
	Chubbuck	(208) 237-6975
Illinois/Iowa	Rock Island	(309) 757-5800
Indiana	Bloomington	(812) 334-4261
Kansas	Manhattan	(785) 539-3474
Kentucky	Frankfort	(502) 695-0468
Louisiana	Lafayette	(337) 291-3100
Maine	Old Town	(207) 827-5938
Maryland	Annapolis	(410) 573-4573
Massachusetts	(See New Hampshire)	
Michigan	East Lansing	(517) 351-2555
Minnesota	Bloomington	(612) 725-3548
Mississippi	Jackson	(601) 965-4900
Missouri	Columbia	(573) 234-2132
Montana	Helena	(405) 449-5225
Nebraska	Grand Island	(308) 382-6468
Nevada	Las Vegas	(702) 515-5230
	Reno	(775) 861-6300
New Hampshire	Concord	(603) 223-2541
New Jersey	Pleasantville	(609) 646-9310
New Mexico	Albuquerque	(505) 346-2525
New York	Cortland	(607) 753-9334
	Long Island	(631) 776-1401
North Carolina	Raleigh	(919) 856-4520
	Asheville	(828) 258-3939
North Dakota	Bismarck	(701) 250-4481
Ohio	Reynoldsburg	(614) 469-6923
Oklahoma	Tulsa	(918) 581-7458
Oregon	Bend	(541) 383-7146
	Klamath Falls	(541) 885-8481
	La Grande	(541) 962-8584
	Newport	(541) 867-4558
	Portland	(503) 231-6179
	Roseburg	(541) 957-3474
Pennsylvania	State College	(814) 234-4090
Rhode Island	(See New Hampshire)	
South Carolina	Charleston	(843) 727-4707
South Dakota	Pierre	(605) 224-8693
Tennessee	Cookeville	(931) 528-6481
Texas	Clear Lake	(281) 286-8282
Utah	West Valley City	(801) 975-3330
Vermont	(See New Hampshire)	
Virginia	Gloucester	(804) 693-6694
Washington	Lacey	(306) 753-9440
	Spokane	(509) 891-6839
	Wenatchee	(509) 665-3508
West Virginia	Elkins	(304) 636-6586
Wisconsin	New Franken	(920) 866-1725
Wyoming	Cheyenne	(307) 772-2374
	Cody	(307) 578-5939

National Office
U.S. Fish and Wildlife Service
Division of Migratory Bird Management
4401 North Fairfax Drive, MBSP-4107
Arlington, VA 22203-1610
(703) 358-1714
http://www.fws.gov/migratorybirds

State Agencies

To contact a state wildlife agency, visit the Association of Fish & Wildlife Agencies' website at http://www.fishwildlife.org/where_us.html

GLOSSARY

The definitions below apply to these National Bald Eagle Management Guidelines:

Communal roost sites – Areas where bald eagles gather and perch overnight – and sometimes during the day in the event of inclement weather. Communal roost sites are usually in large trees (live or dead) that are relatively sheltered from wind and are generally in close proximity to foraging areas. These roosts may also serve a social purpose for pair bond formation and communication among eagles. Many roost sites are used year after year.

Disturb – To agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

In addition to immediate impacts, this definition also covers impacts that result from human-caused alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle=s return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

Fledge – To leave the nest and begin flying. For bald eagles, this normally occurs at 10-12 weeks of age.

Fledgling – A juvenile bald eagle that has taken the first flight from the nest but is not yet independent.

Foraging area – An area where eagles feed, typically near open water such as rivers, lakes, reservoirs, and bays where fish and waterfowl are abundant, or in areas with little or no water (i.e., rangelands, barren land, tundra, suburban areas, etc.) where other prey species (e.g., rabbit, rodents) or carrion (such as at landfills) are abundant.

Landscape buffer – A natural or human-made landscape feature that screens eagles from human activity (e.g., strip of trees, hill, cliff, berm, sound wall).

Nest – A structure built, maintained, or used by bald eagles for the purpose of reproduction. An **active** nest is a nest that is attended (built, maintained or used) by a pair of bald eagles during a given breeding season, whether or not eggs are laid. An **alternate** nest is a nest that is not used for breeding by eagles during a given breeding season.

Nest abandonment – Nest abandonment occurs when adult eagles desert or stop attending a nest and do not subsequently return and successfully raise young in that nest for the duration of a breeding season. Nest abandonment can be caused by altering habitat near a nest, even if the alteration occurs prior to the breeding season. Whether the eagles migrate during the non-breeding season, or remain in the area throughout the non-breeding season, nest abandonment can occur at any point between the time the eagles return to the nesting site for the breeding season and the time when all progeny from the breeding season have

dispersed.

Project footprint – The area of land (and water) that will be permanently altered for a development project, including access roads.

Similar scope – In the vicinity of a bald eagle nest, an existing activity is of similar scope to a new activity where the types of impacts to bald eagles are similar in nature, and the impacts of the existing activity are of the same or greater magnitude than the impacts of the potential new activity. Examples: (1) An existing single-story home 200 feet from a nest is similar in scope to an additional single-story home 200 feet from the nest; (2) An existing multi-story, multi-family dwelling 150 feet from a nest has impacts of a greater magnitude than a potential new single-family home 200 feet from the nest; (3) One existing single-family home 200 feet from the nest has impacts of a lesser magnitude than three single-family homes 200 feet from the nest; (4) an existing single-family home 200 feet from a communal roost has impacts of a lesser magnitude than a single-family home 300 feet from the roost but 40 feet from the eagles' foraging area. The existing activities in examples (1) and (2) are of similar scope, while the existing activities in example (3) and (4) are not.

Vegetative buffer – An area surrounding a bald eagle nest that is wholly or largely covered by forest, vegetation, or other natural ecological characteristics, and separates the nest from human activities.

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CAMP RAVENNA FEDERALLY LISTED THREATENED & ENDANGERED SPECIES MANAGEMENT GUIDANCE

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UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994

January 21, 2015

Brian Riley
OHARNG Natural Resources Manager
Camp Ravenna Joint Military Training Center
1438 State Route 534 SW
Newton Falls, Ohio 44444

Dear Mr. Riley,

TAILS#: 03E15000-2015-IC-0542

This is in response to your January 6, 2015 Biological Evaluation to evaluate potential impacts of various development, maintenance, training, and conservation practices conducted at Camp Ravenna Joint Military Training Center (Camp Ravenna), on the proposed endangered northern long-eared bat (*Myotis septentrionalis*).

The Biological Evaluation provides an analysis of the following activities at Camp Ravenna:

- Timber harvest and timber stand improvement, including minor forest products and invasive species control
- Other land management activities (grassland, prairie, and brush management)
- Prescribed fire
- Buildings and facilities (demolition, maintenance, construction, and pest control)
- Hazardous tree removal
- Military training and readiness activities

We have reviewed the proposed activities and concur with your determination that the proposed activities are not likely to adversely affect the northern long-eared bat. This concurrence is based on the following conservation measures that will be implemented at Camp Ravenna.

- Forest management to retain habitat diversity and long term sustainability of the forest ecosystem
- Retention of dead, damaged, and dying trees whenever practicable
- Retention of adequate roost trees and snags $\geq$ 3 inches diameter at breast height (dbh)
- Retention of trees around potential roost trees
- Preforming timber harvest and forest clearing between October 1 and March 31
- Removal of hazard trees between October 1 and March 31 whenever practicable
- Removal of no more than 20 hazard trees $\geq$ 3 inches dbh between April 1 and September 30
- Limit forest clearing for range and/or facility construction projects to $\leq$ 40 acres
- Conduct brush cutting for vegetation $\geq$ 3 inches dbh between October 1 and March 31
- Implement integrated pest management procedures and minimize the use of pesticides

in and around potential bat roosting areas
- Conduct prescribed burns in potential roosting habitat outside of the brood season (June 1 – July 31) whenever possible. Burns conducted during the brood season will be of low/moderate intensity
- Avoid construction activities after sunset within potential roosting habitat
- Continued implementation of Camp Ravenna's Integrated Contingency Plan to avoid and minimize pollution and to effectively respond and cleanup releases of petroleum and other products.
- Avoid filling, channelizing, or degrading streams, wetlands, and other water areas and obtaining appropriate permits when impacts cannot be avoided
- Construct linear features in existing rights-of-ways and edges of woodlots whenever possible
- Utilizing horizontal directional boring for pipeline crossing of stream corridors whenever possible
- Avoiding demolition of structures during the brood season (June 1 – July 31) when/if bats are present whenever possible
- Ensure bats are properly removed/excluded from structures prior to demolition
- Examine bridge undersides for bats prior to performing construction or demolition activities and consult with USFWS should bats be present

This concludes voluntary informal conferencing on this action under section 7(a)(2) of the Endangered Species Act. Should, during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, conferencing/consultation with the Service should be reinitiated to assess whether the determinations are still valid.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (ESA), as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy.

If you have questions, or if we may be of further assistance in this matter, please contact Angela Boyer at extension 22 in this office.

Sincerely,

Megan Seymour
Acting Field Supervisor

cc: Nathan Reardon, ODOW (email)
Jennifer Norris, ODOW (email)

THE ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARTY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

NGOH-IMR-ENV

6 January 2015

Ms. Angela Boyer
US Fish & Wildlife Service
4625 Morse Rd., Suite 104
Columbus, Ohio 43230

Dear Ms. Boyer,

The Ohio Army National Guard (OHARNG) has conducted a Biological Evaluation (BE) to evaluate potential impacts of various development, maintenance, training and conservation practices conducted at Camp Ravenna Joint Military Training Center (CRJMTC) located in Portage and Trumbull County, Ohio, on the Proposed Endangered Northern Long-Eared Bat (NLEB), a species known to occur at CRJMTC. Included within the attached BE are detailed descriptions of various ongoing activities that take place at CRJMTC and a detailed analysis on how they may impact the NLEB and critical habitat. The BE also identifies conservation measures the OHARNG is proactively implementing to benefit the NLEB prior to it being federally listed which is likely to happen in April 2015. The OHARNG's intent is to enter into an informal conference with the USFWS in this regard.

The OHARNG has conducted a number of natural resources surveys at CRJMTC over the last several years and has extensive baseline information about on-site natural resources and species present. No federally listed threatened and endangered species are known to reside at the CRJMTC, and no critical habitat occurs on site. The proposed endangered NLEB does exist on site. Based on our BE and the conservation measures in place at Camp Ravenna, the OHANRG has determined that implementation of the action described in the BE will not jeopardize the existence of the NLEB. Further, because no federally listed species have been found at Camp Ravenna and because no designated critical habitat occurs on site, it is the conclusion of the Ohio Army National Guard that implementation of the action outlined in the attached Biological Evaluation will result in a determination of **"no effect"** on any currently listed species.

The OHARNG requests your review and concurrence with our findings. If you need more information or have any questions, please contact me by phone at 614-336-4564 or by email at brian.p.riley17.nfg@mail.mil.

Sincerely,

Brian P. Riley
Natural Resources Manager
Camp Ravenna Joint Military Training Center

Attachments

Biological Evaluation Regarding Impacts of Training and Conservation Practices on the Northern Long-Eared Bat (*Myotis septentrionalis*) at the Camp Ravenna Joint Military Training Center, Portage and Trumbull County, Ohio.

Prepared By
THE ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARTY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

6 January 2015

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1.0 INTRODUCTION

1.1 Purpose of Informal Conference

Section 7 of the Endangered Species Act (ESA) requires consultation with the US Fish & Wildlife Service (USFWS) when a proposed federal action "may affect" a listed species. Pursuant to Section 7(a)(4) of the ESA, federal action agencies are required to confer with the US Fish & Wildlife Service (USFWS) if an action they are proposing is likely to jeopardize the continued existence of a species that is proposed for federal listing, including the proposed endangered Northern Long-Eared Bat (NLEB) (50 CFR 402.10(a)). A conference is required only if an action is likely to jeopardize the continued existence of a species proposed for listing or negatively impact proposed critical habitat.

The Ohio Army National Guard (OHARNG) has prepared this Biological Evaluation (BE) to evaluate the impacts of our existing and ongoing training and management activities at the 21,683-acre Camp Ravenna Joint Military Training Center (Camp Ravenna or CRJMTC) property in Portage and Trumbull Counties, Ohio on the proposed endangered NLEB (may want to include "and current listed species" if recommended by USFWS). The OHARNG is voluntarily implementing conservation measures for the NLEB and managing the Camp Ravenna property and natural resources to maintain ecosystem health and diversity in perpetuity. The actions described in this BE will not jeopardize the continued existence of the proposed endangered NLEB or negatively impact any critical habitat but since the NLEB and summer habitat are present at Camp Ravenna our actions may affect the NLEB. As such, and because the NLEB is not yet listed, the OHARNG requests an informal conference with the USFWS and concurrence on OHARNG's determination that ongoing actions at Camp Ravenna may affect, but are not likely to adversely affect the NLEB.

1.2 Purpose and Need for the Action

The primary purpose of Camp Ravenna, formerly known as Ravenna Training and Logistics Site (RTLS), is to support military training on a sustainable, long term basis. Healthy ecosystems are needed to support this purpose. The purpose of the Ohio Army National Guard is to serve the citizens of Ohio and America by fulfilling our state and federal military role of providing public safety when ordered by the Governor or support of the National Military Strategy when ordered by the president. In order to fulfill this critical duty to state and country, the OHARNG must be able to facilitate military training exercises and implement conservation practices in support of Camp Ravenna's long-term training mission in an expedient and responsible manner.

The Camp Ravenna Integrated Natural Resources Management Plan (INRMP), as developed and approved by partner agencies Ohio Department of Natural Resources (ODNR), US Fish and Wildlife Service and National Guard Bureau (NGB), sets forth DOD's congressional mandate to manage properties with "significant natural resources". The INRMP is the primary guidance document and tool for managing natural resources at Camp Ravenna to ensure sustainable use and long term availability of the property to support military training. There has been an INRMP for the property since the 1970's. The Camp Ravenna INRMP was created in 2001 and has been updated every five years since. Completed in November 2001, the Camp Ravenna Environmental Assessment paved the way for the conservation projects and practices outlined in the INRMP to be enacted. The action that is the focus of this BE is the implementation of the Camp Ravenna INRMP and ongoing military training activities.

2.0 DESCRIPTION OF ACTION AREA & ACTION

2.1 Action Area Description

Camp Ravenna is located in east-central Portage and southwestern Trumbull Counties in northeastern Ohio. Trumbull County is bordered to the east by the Pennsylvania state line. The facility is located approximately 56 kilometers (35 miles) southeast of Cleveland, 4.8 kilometers (3 miles) east-northeast of the city of Ravenna, 24 kilometers (15 miles) west-southwest of the city of Warren, and 1.6 kilometers (1 mile) northwest of the City of Newton Falls.

A total of 21,683-contiguous-acres of property is managed and trained on at Camp Ravenna. Camp Ravenna is approximately 17.7 kilometers (11 miles) long and 5.6 kilometers (3.5 miles) wide. Of the 21,683 acres within the facility, 16,812 acres are forested (URS, 2010), approximately 4,000 acres are old field/shrub habitat and approximately 825 acres are grassland habitat. Currently, a total of 18,772 acres (87%) is classified as unimproved land with an additional 2500 acres being classified as semi-improved grounds which receive some maintenance, but are not intensively maintained as improved grounds (approximately 411 acres). The Camp Ravenna property boundary is fenced with barbed wire topped chain-linked fence. There are approximately 243 miles of streams, 282 acres of ponds, and 2,300 acres of wetlands on site. The forests are dotted with vernal and perennial pools. There are approximately 200 miles of roads and 100+ miles of old railroad track beds that provide access throughout Camp Ravenna. There are 11 miles of active railroad track, which includes a 19 track classification yard. There are over 600 empty earth cover magazines and a few active earth covered magazines used to support training and other operations. There are training venues throughout Camp Ravenna to include several live fire ranges, non-live ranges, an engineer heavy equipment training area, a tactical maneuver area, convoy training routes, dismounted training areas, drop zones, maintenance facilities, barracks, and administration areas.

The OHARNG currently occupies and operates Camp Ravenna. Camp Ravenna is the former Ravenna Army Ammunition Plant that has been repurposed as a military training site. The process of developing Camp Ravenna into a training site includes investigation and cleanup of former industrial sites; demolition of former facilities and buildings; re-development of electric distribution, potable water and sanitary sewer systems; road and other infrastructure upgrades and maintenance; reuse of some facilities; and construction of new administrative buildings, maintenance facilities, weapons ranges, and training venues. The process of converting the former ammunition plant into a training site began in 1999 when the OHARNG became accountable for a 16,000+ acre portion of the site. Since that time military training activity has steadily increased as well as improvements in infrastructure, training venues and personnel to support the training and management/maintenance of Camp Ravenna.

There has been active natural resources management on the property since the 1970s. The OHARNG took over the natural resources management program in 2000 and finalized the first Camp Ravenna (called the Ravenna Training and Logistics Site at the time) Integrated Natural Resources Management Plan in 2001. There is an active forest management program, wildlife habitat improvement program and deer management program at Camp Ravenna. The OHARNG has aggressively inventoried flora and fauna since INRMP development and we have extensive baseline data of species on site. The data indicates the property is rich in biological resources and species diversity and continues to be so even with the ongoing site development and military training activity. There are several state listed species and a nesting pair of bald eagles on post. It is our belief that the training is not causing negative impacts and our natural resources management activities are having a positive impact.

2.2 Conservation Practices & Programs

All conservation practices implemented are described in the Camp Ravenna INRMP. Each practice is designed and implemented to enhance and facilitate training opportunities at Camp Ravenna. Conservation practices vary in scope but are all intended to enhance wildlife habitat and diversity and create sustainable conditions for military training (i.e. invasive species control). This section outlines in detail the conservation projects and practices that are planned or ongoing at Camp Ravenna.

2.2.1 Timber Harvesting

The forests at Camp Ravenna are actively managed with the goal of retaining vigorous and resilient forests that support a diverse mix of species. Management generally retains fully stocked stands. Harvests are used to imitate natural disturbances and create conditions suitable for forest regeneration. Canopies are mostly kept intact with small openings. Occasionally larger openings of one half or five acres may be made to favor shade intolerant regeneration, shrubs, herbs and insect production of wildlife. Shelterwood harvesting and clear-cutting have not historically been conducted but could be used if conditions dictate these are the best practices to meet our management objectives to regenerate the forest and provide habitat diversity. In general, larger tracts of timber over 100 acres in size are managed with less intense disturbance and in a manner that retain the forest canopy. Smaller tracts of timber and fragmented stands are managed using techniques that result in more disturbance and better favor retention of shade intolerant tree species. The goal of the forest management program is not to maximum timber production, but to use timber management and harvesting as a tool to maintain healthy diverse ecosystems that in support the military mission. A more detailed discussion of forest ecosystem management philosophy and practice is found in Section 6.8 of the INRMP, of which the USFWS has a copy.

Timber management has taken place on site for forty years and the forested acreage has increased from approximately 5,000 acres in 1940 to over 16,000 acres today. The total volume of timber harvested in a given year is no more than half of the total ten-year estimated growth of the respective forest management compartment. There is always more growth than what is harvested. Timber sold from CRJMTC is marked and 100% tallied by Camp Ravenna Environmental Staff and US Army Corps of Engineers (USACE) Forester. Each individual responsible for marking timber at Camp Ravenna has served as a professional forester in either the public or private sector and has the training, knowledge and expertise to properly select trees for sale, execute timber sales and enforce BMPs on logging operations. Timber marking guidelines are provided in Sections 6.8.5.7 and 6.8.9 of the INRMP. Trees NOT marked include those with evident holes and cavities that are or have been utilized by wildlife. Dead/snag trees and trees with loose bark still clinging to the bole are left standing for wildlife habitat.

Forest land is not cleared as part of the forest management program. Forest clearing is scheduled and conducted only as needed to support approved construction projects that have undergone National Environmental Policy Act (NEPA) review. The only instance in which forest land is permanently cleared is when an area is being developed and a range, facility or

structure is being built on a forested site. In this case the timber is harvested and salvaged as part of the land clearing. The OHARNG tries to avoid forest clearing whenever possible and when not possible, tries to locate development on low diversity immature forests such as red maple field reversions. To date the largest clearing has been approximately five acres. A couple of future range development projects will result in the permanent clearing of trees on up to forty (40) acres each. These clearings are considerably small when compared to the amount of forested acres (16,812) that surrounds them on site at CRJMTC. Furthermore, the habitat loss from such clearing could be offset by increases in insect production and bugging area within the opening, even if the opening is managed as maintained grasslands. The OHARNG proposes that clearings of this size when done outside of the brood season will not negatively impact the NLEB population.

Due to the presence of NLEB on site, no trees greater than three (3) inches DBH will be felled between 1 APR and 30 SEP (INRMP Section 6.4.1.7). This practice results in damage to forest soils because it forces timber harvesting to take place when the soil is saturated during the wet season. Winter freezes hard enough to support logging equipment have been very uncommon the last decade, so the winter cold has not offered any relief from soil damage. Soil damage can result in tree root injury and tree decline and death as well as soil erosion and surface water pollution. To help mitigate the impacts of the felling restriction to forest soils, loggers are permitted to top, skid and load trees felled outside of the bat brood season (1 OCT to 1 APR) at any time of the year when the soil is firm enough to support equipment. This practice results in a seasonal restriction on tree felling activity but not on other non-felling logging activities and helps maintain the long term health of the forest by minimizing soil damage. Gasoline chainsaws and mechanical skidders with cables or grapples and horse-drawn buggies are used by winning bidders in execution of this annual action.

2.2.2 Minor Forest Products

Tree-tops are often left behind by the logger following the harvest. For aesthetic purposes, most tops are not left more than five feet above ground. Most often, tops are sold for firewood to Camp Ravenna employees and members of the general public. Harvesting of the tree tops of felled trees for firewood is not restricted during the 1 April to 30 September brood season because it does not involve the felling of trees and in decades of cutting firewood there has never been a recorded bat encounter and firewood cutters are capable of avoiding bats or delaying their cutting if bats are encountered. For this reason, harvesting of logging tops and other downed or fallen woody debris is permitted with no seasonal cutting restrictions. Occasionally other minor forest products such as locust posts are sold that require felling of trees. Season felling restrictions that prohibit tree felling during the bat brood season are enforced for all minor forest product sales that include felling of trees three-inches DBH or larger.

2.2.3 Timber Stand Improvement

Various Timber Stand Improvement (TSI) practices take place at CRJMTC which are designed to enhance woodland health, growth and sustainability. TSI practices have been taking place for decades, the results of which are reflected in the health and vigor of the treated

woodlands at CRJMTC. The types of TSI practices that regularly take place include grapevine control, crop tree release and beech control. The control of grapevines involves cutting grapevines at eye level and everywhere the vines root into the ground and then treating the cut stem with and approved herbicide. Occasionally grapevines are treated with a basal bark treatment of herbicide without cutting the vines. The only areas in which grapevines are controlled are those in which they are inhibiting (and killing) desirable, mast producing species that are most beneficial to wildlife including oak, walnut, cherry and hickory. A grapevine component is always left in the forest as wildlife habitat. Grapevines are usually less than three-inches in diameter but occasionally grapevines greater than three-inches in diameter are cut, however, all cut vines are left hanging and so the physical habitat component provided by the vines is not removed in the vine control process.

Beech control involves cut stump, girdle and treat or basal bark spraying of the targeted beech trees with concentrated herbicide during the active growing season. Crop tree release involves double girdling each targeted tree to a depth of at least one inch six-inches apart on the trunk and leaving the tree to die standing so that it may also serve as wildlife habitat. Some species such as red maple and beech are triple girdled to ensure that the tree does not heal itself and continue growing. Herbicides may also be applied to the girdles. The trees that are left behind are healthier and generally more beneficial to wildlife. The objective of the beech control is simply to control the amount of beech in woodlands where its presence in the forest (especially forest understory) is over-abundant, thus preventing sunlight-dependent species such as oak, cherry and walnut from being able to regenerate. This practice involves the removal of all beech trees, usually within a 50-100 foot radius of an existing desirable oak that is 12-inches in diameter or larger. This practice serves to help diversify woodlands at Camp Ravenna that would otherwise become a beech monoculture. Most of the trees treated in this practice are young trees with tight bark and lacking cavities. Trees are generally not felled in this process except for trees that are along roadsides, fencing and/or are adjacent to structures, which are felled so as to not damage property or cause bodily harm. The trees that pose an imminent threat to property and safety will be felled in accordance with Section 2.3.4.

TSI practices that include felling trees less than three inches in diameter at breast height (DBH), basal bark treatment, hack/frill and squirt or girdle and squirt herbicide applications to any size trees as well as foliar applications to seedlings and cut surface and basal bark applications to grapevines are conducted at Camp Ravenna with no seasonal cutting restrictions. Any of the TSI practices stated herein that require felling trees greater than or equal to three (3) inches in diameter complies with seasonal felling restrictions with tree felling permitted between 1 OCT and 31 MAR.

Periodically, forest stands in need of thinning are done so as part of a chainsaw safety training program sponsored by the Northeast Ohio Loggers Chapter of the Ohio Forestry Association. Over the years, Camp Ravenna has hosted chainsaw safety/directional felling classes at Camp Ravenna in stands due for thinning and approved by the Camp Ravenna Environmental Office. This event shall continue to take place at Camp Ravenna. Seasonal felling restrictions will be enforced for any trees greater than three-inches DBH felled as part of the chainsaw safety training.

2.2.4 Invasive Species Control

Invasive species pose a continuous threat to the ecosystem sustainability at Camp Ravenna. Invasive species wreak havoc on biological communities and inhibit military training. Some of the non-aquatic exotic, invasive species present at Camp Ravenna and treated over the years include ailanthus/tree-of-Heaven (*Ailanthus altissima*), multiflora-rose (*Rosa multiflora*), glossy buckthorn (*Frangula alnus*), autumn-olive (*Elaeagnus umbellata*), and Japanese knotweed (*Fallopia japonica*). Treatments include uprooting plants, brush-hogging, foliar herbicide application, basal bark herbicide treatments, cut stump herbicide treatment, girdle and squirt herbicide treatments, trunk injection herbicide treatments and girdling. Of these invasive species, ailanthus/Tree-of-Heaven is the only invasive species at Camp Ravenna that exceeds three-inches DBH. Like the aforementioned beech, ailanthus trees are treated via basal bark treatment or by systemic trunk-injection treatments. Usually trees/vegetation over three-inches DBH are not felled. The only exotic and invasive trees dropped in execution of this project are those that are located along roadsides, fencing and/or are adjacent to structures so as to not damage property or cause bodily harm. These trees are felled in accordance with the seasonal cutting restriction between 1 OCT and 31 MAR and left in the woods to decay.

2.2.5 Young Forest Habitat

The objective of this conservation project is to remove successional hardwoods from old field types to maintain an early successional habitat for declining species of wildlife under the "Lower Great Lakes American Woodcock and Young Forest Initiative." This project began in FY12 and to date, 128 acres have been set back to young forest types. According to the Wildlife Management Institute, Camp Ravenna is home to the largest breeding population of American woodcock (*Scolopax minor*) in Northeast Ohio. Other declining grassland and young forest-dependent bird species to benefit from this conservation practice include yellow breasted chat, prairie warbler, whip-poor-wills and field sparrows. This project involves the removal of all successional hardwood trees two-inches in diameter or greater using brush hogs or other heavy brush cutting equipment. Trees and shrubs left behind include early successional soft mast-producing species such as crabapple, hawthorn, dogwood, viburnum and wild plum. The activity does not convert any forested land to non-forested land, it simply sets back succession to benefit declining wildlife species. The OHARNG intends to periodically maintain these young forest areas as need be by removing successional hardwoods that are at least three inches in diameter. Prior to the NLEB proposed listing vegetation cutting times were restricted until after the bird nesting season, usually until after mid-August or early September. In locations with vegetation greater than three-inched DBH this activity is now only conducted between 1 OCT and 31 MAR.

2.2.6 Grassland Mowing and Disking

The objective of this conservation practice is to maintain suitable habitat for grassland bird species and training venues. Mowing for this purpose is conducted both in-house and by hired contractors after 15 August (usually after 1 October) and extending up until 15 April (usually before 1 April). October is the preferred month for mowing grasslands at Camp Ravenna as the ground is usually dry and firm. Mowers mow around any large trees within grassland areas. If trees over three-inches DBH need to be removed, they are felled/removed

between 1 October and 31 March. Mowing is not the best method for managing grasslands. It's often used because it's the most readily available. It generally does not provide an open area at ground level with a vegetation canopy, which is needed for good grassland habitat. Mowing usually results in a buildup of organic material and debris at the ground level. To help combat this problem both disking and prescribed fire are used. Fire is discussed below. Disking can be done in strips or irregular patterns of ≥ 50 feet wide or blocks of 1 acre or more every one to three years. Disking is done shallow so as to disturb the surface which may take two to four passes. Disking is done either in the fall between September and October or in the spring between February and April.

2.2.7 Prairie Establishment

One of the projects planned for out years is the creation of small, roadside prairies in old borrow site scraped areas around Camp Ravenna where the soil is thin, gravelly and are mostly overgrown with invasive species including multiflora-rose (*Rosa multiflora*) and autumn-olive (*Elaeagnus umbellata*). A few scattered, small diameter trees and shrubs occur throughout the proposed prairie establishment areas which will be removed as part of the prairie creation. Many of the scattered trees and shrubs, though small, are greater than three-inches in diameter and will be removed in between 1 OCT and 31 MAR.

2.2.8 Brush Management

Brush is a big problem in roadside ditches at Camp Ravenna where it impacts drainage and contributes to road and culvert failures. Most of the vegetation in road ditches is less than three-inches in diameter and is controlled by brush cutting and/or herbicide treatments. Brush has also grown up around many of the old building at Camp Ravenna and the OHARNG does not have the staff to perform regular mowing to maintain the vegetation in all areas on post. Training areas also require periodic mowing to keep them open for training and areas need recovery from overgrown brush. Brush cutting of vegetation greater than three-inches in diameter is done between 1 October and 31 March in accordance with season cutting restrictions. Brush cutting of vegetation less than three–inches in diameter is done in accordance with vegetation control strategies outlined in the Camp Ravenna INRMP and as stated in Section 4.1. There are no season restrictions imposed on the application of herbicides to brush other than as stated in the product labels.

2.2.9 Prescribed Fire

Prescribed fire has taken place in the past as a form of grassland and old field management, however, this practice has not yet been used for forest management purposes although the OHARNG intends to begin using prescribed fire as a woodland management tool as well. The OHARNG has recently partnered with the Ohio Chapter of the Nature Conservancy to update the Camp Ravenna Integrated Wildland Fire Management Plan. This plan was updated in July 2014 and is an addendum to the Camp Ravenna INRMP. This updated plan identifies dry woodland, grassland and prairie establishment sites throughout Camp Ravenna and has each area broken into specific burn units of varying size with cover type identified. The forested burn units include native and planted upland oak species including white oak (*Quercus alba*) and

chestnut oak (*Quercus montana*) where regeneration of these species is desired. It is the intention of the OHARNG to hire an Ohio Certified Burn Boss and begin implementing the Camp Ravenna Wildland Fire Management Plan as early as 2015. The burns are timed just before green-up when the fuel moisture content is conducive to burning and prior to the nesting season or in the fall after nesting season when the fuel is plentiful and dry (OHARNG, 2014). The ideal period for conducting prescribed burns is August through April, usually with a spring Mar-Apr), a fall (Aug-Oct), and a winter (Nov-Feb) burning season. Often conditions conducive to burning exist in the summer months and natural fires are not confined to spring and fall. Avoiding summer burns is usually done to avoid the nesting and brood production periods, although Rob Chapman, Extension Wildlife Specialist, Purdue University, has experimented with summer burns and had some success with negligible impact on wildlife populations. Controls burns will be conducted between 1 August and 15 April as burn conditions are conducive to meeting the burn goals. If summer burns are considered, further coordination with the USFWS will be conducted prior to burning.

2.3 Buildings & Facilities

The OHARNG controls over 800 buildings/structures scattered throughout Camp Ravenna. Buildings and facilities situated throughout Camp Ravenna are maintained as need demands and funding allows. Many of the old World War II era structures have been demolished and the few remaining that cannot be repurposed will be demolished as funding is available. Camp Ravenna has a Master Plan that identifies the development of new facilities and infrastructure to meet mission support needs. Most development is within existing cantonment areas with the exception of ranges. New structures and facilities are built (i.e. ranges, barracks, shelter houses, etc.) as funding is available. All projects are subject to National Environmental Policy Act (NEPA) review and major construction projects go through an involved approval Department of the Army process. This description is included as part of the action because there is a natural resources management and compliance component associated with building and facilities maintenance.

2.3.1 Maintenance

The type of routine maintenance conducted on buildings and facilities at Camp Ravenna includes door, window, siding, roof, awning, soffit replacement, interior and exterior painting and replacement of failed components. Grounds maintenance includes road patching and paving, culvert replacement, fence repair, mowing and vegetation control, brush cutting, and snow and ice removal.

Occasionally bats or birds are found in or on maintained buildings/structures. If bats are found on or inside of a building, the OHARNG safely removes from the building and that the bat is not harmed in the process. If young bats are present and the building is being used as a brooding area, maintenance is postponed until after the brood season and the bats have left on their own. In the event that a given building scheduled for exterior maintenance is found to harbor nesting birds of a native species to North America, the OHARNG waits until the birds have fledged to commence action unless the birds are non-protected nuisance (exotic) species.

2.3.2. Demolition

Occasionally, dilapidated buildings are torn down and demolished on site. Buildings are stripped of asbestos and hazardous materials before demolition and these wastes properly disposed.

Many of these abandoned buildings have broken windows and holes in the soffits that could allow for bats to enter. The OHARNG inspects buildings prior to demolition to make sure that no bats or nesting birds occupy any such structure. Should a building scheduled for demolition be found to harbor bats, if possible, the OHARNG will wait to commence the action after the brood season and after the bats have left on their own. If the demolition cannot wait, the bats will be safely removed and excluded from the building prior to demolition. Should a given building scheduled for demolition be found to harbor nesting birds, the OHARNG will wait until the birds have fledged to commence action unless they are determined to be a non-native species such as European starling (*Sturnus vulgaris*).

2.3.3 Construction

Periodically, new facilities and structures with associated access roads, parking, water, sewer and electrical lines are constructed. Most new building construction is conducted in existing cleared cantonment areas. A central range impact area has been designated within the center of post centered on a previous munitions burning area. Most range development is peripheral to this central impact area. Some of the ranges are large (30 to 300 acres) and require the clearing of forested area for at least part of the construction. The clearing of forest for ranges could impact the NLEB and other species. Direct impacts can be avoided by following seasonal cutting restrictions and laying out ranges to avoid forested areas as much as possible. Clearing forest also results in indirect impacts from the lost of the forested habitat. Such impacts could be negative, neutral or positive. The OHARNG contends that the loss of up to forty (40) acres of forests at Camp Ravenna per project will have no effect on the NLEB or other listed species because of the vast acreage of forest habitat on site. Limited removal of the forest canopy by either clearing or clear-cutting will provide bugging areas and may even improve local habitat conditions.

2.3.4 Hazardous Tree Removal

As can be expected on any large, heavily wooded installation, there is always the possibility of trees needing to be removed immediately due to the sudden imminent threat they pose to human health and safety. Other reasons for immediate tree removal include storm damaged trees and limbs on roads, fences (also a security issue), wires, and other infrastructure and structures. The need to remove hazard trees typically arises when a large tree dies suddenly from insect or disease, suffers extensive storm damage, is found to be hollow or is in a significant state of decline. The OHARNG can remove some hazard trees outside of the bat brood season but at times the need to remove hazard and/or storm damaged trees may arise during bat brood season. The OHARNG proposes that cleaning up limbs of damaged trees and felling and removal of up to twenty (20) standing hazardous or damaged trees that are greater than or equal to three (3) inches in diameter at breast height (DBH) during the brood season will

not adversely affect the NLEB or any listed species. If bats are discovered during a hazard tree removal, the removal will stop and the USFWS will be consulted.

2.3.5 Pest Control

Pest control operations include vegetation control, vertebrate pest control, and insect control. Herbicides are used to control vegetation in parking lots, roadside ditches, mowing obstructions, along building drip lines, under fence lines, on gravel road surfaces and in fence and right-of-way clear zones. Most herbicide treatments are with selective herbicides intended to control woody vegetation and retain herbaceous vegetation, but some treatments, such as in parking lots and under fence fabric, are with non-selective herbicides designed to control all vegetation. Vertebrate pests, such as mice, are controlled mostly with exclusionary measures and non-chemical means such as snap and sticky traps. Insect control is mostly done to control wasps in buildings and vehicles and mosquitoes within bivouac and troop housing areas. Wasp control is done either by self-help application of commercial wasp spray or by profession application to individual problem areas. Mosquito control is usually done by fogging problem areas and larvacide tablet application to individual breeding areas. Preventative measures to remove man-made breeding sites are implemented, but most breeding sites are natural wetlands and vernal pools that cannot be drained. Fogging provides temporary relief during periods of high mosquito activity.

2.4 Military Training & Readiness

Camp Ravenna exists so the OHARNG and other services can train and be prepared when called to respond for either a state or federal mission. Specific military missions and training requirements are fluid and change from time to time with realignments, transformations, and changes in equipment and tactics. The OHARNG trains and maintains combat ready units, with soldiers available to mobilize in support of national military strategy. To this end, the OHARNG provides organized, trained, and equipped units to preserve peace, order and public safety and to act in the event of a disaster when so ordered by the Governor of the State of Ohio. Military training is included in the description of the action because there is a natural resources management and compliance component associated with successful completion of the training mission. Military training is conducted year-round at Camp Ravenna with the busy season usually from March through October. Training activity at Camp Ravenna has undergone NEPA review. The ongoing training exercises that are conducted at Camp Ravenna include the items below.

2.4.1 Range Operations

CRJMTC operates three conventional, live fire small arms ranges which accommodate the M16/M4 weapons family, the M249 and M240 series machine guns, the M9 and M1911 series pistols, and M203 and MK19 Grenade Launchers. Additionally, there is a Light Demolitions Range and a Live Grenade Familiarization Range. Camp Ravenna also has several non-live fire ranges including a Laser Engagement Range and two Hand Grenade Qualification Ranges. The OHARNG is currently designing a Modified Record Fire (MRF) range, which is the standard military rifle range. The MRF range is slated for construction in 2016. Other ranges are also designed and awaiting funding and some are constructed and awaiting targetry. Ranges

are built in accordance with the Camp Ravenna Range Development Plan, which has undergone NEPA review. The ranges are fixed facilities and use does not result in additional disturbance to habitat. Some of the small arms ranges have berms behind the targets that catch most of the bullets. Bullets travel down range in forested areas for ranges without berms. The hand grenade and demolition ranges produce noise from explosive detonations. These ranges are usually utilized less than a dozen times per year. Construction of new ranges usually involves clearing of some forest. See discussion in Section 2.3.3.

2.4.2 Convoy Operations

CRJMTC has several roads and routes designated for convoy training operations which have daytime and night time operational capability. Convoy operations are common to nearly every unit in the OHARNG as driver training and training in Battle Drills are accomplished by driving on the convoy routes with all varieties of organizational vehicles. Convoy operations are restricted to the paved roadways with no off-road driving permitted. Convoy training and operations can take place year-round but the most attractive times are March through October when temperature is most favorable and snow and ice conditions are at a minimum. Convoy training can include staged ambushes complete with pyrotechnics, hand grenade and improvised explosive devise simulators, blank ammunition and obscurant smoke.

2.4.3 Land Navigation

Land navigation exercises are typically conducted on foot, by individual Soldiers or small teams of Soldiers using a compass and map for reference while accomplishing various orienteering tasks. Movements take place across varying terrain, through brush and wooded areas, over and around obstacles in order to reach an objective. Cutting of vegetation and limbs is not necessary as most areas are easily bypassed leaving little disturbance to the areas involved. Land navigation takes place year round but is more concentrated during the favorable weather conditions available from March through November.

2.4.4 Aircraft Operations

Camp Ravenna accommodates both fixed win and rotary wing aircraft training and operations.

- Fixed wing operations are limited to over flights involving parachute drops (cargo only), simulated areal spray operations, and low level flight training in C130 multi-engine turboprop aircraft of the Air National Guard and Air Force Reserve. There are no fixed wing runways on the site so no fixed wing aircraft take-offs or landings on the site.
- Rotary wing aircraft of the Ohio Army National Guard train within the facility employing take off and landings, map of the earth night-vision flying, hot refueling, hover training, sling load operations, water rescue basket retrieval, and proficiency training for pilots and crews.

2.4.5 Armored Vehicle Training

Armor operations typically take place during the spring months of March through May with some limited activity taking place into June. Armored vehicles train on prepared tank trails in areas with storm water management controls. A minor amount of training is done off road at the tactical vehicle maneuver area (TVMA), which is a grassland area managed to supported limited tracked vehicle training. These vehicles are very heavy and create noise and vibration local to the immediate area. Main guns are not fired at Camp Ravenna. Blank ammunition up to 50 caliber is fired from some of the armored vehicles.

- Training on the M1A1 Abrams Main Battle Tank and the M2 and M3 Bradley Fighting Vehicle Systems is conducted on the site. Since there are no ranges on the facility capable of supporting the weapons systems of these armored vehicles, training is limited to convoy and maneuver operations and target engagement with a laser system fitted to the vehicle's main gun.
- Laser engagements take place exclusively on the Table 5 Range located on the extreme east side of the base. The range is made up of grassland with prepared battle positions, target emplacements, berms and mechanized target movers.
- Driving takes place on both the Tank Driving Route (TDR), a designated route incorporating both paved and unpaved roads and on tank trails built specifically for that purpose. Future plans call for improvement of the TVMA that will be prepared for off road operations, which will be restricted to that site exclusively.

2.4.6 Infantry

Dismounted training includes small unit infantry tactics, reconnaissance, terrain and map analysis, escape and evasion tactics, infiltration tactics, land navigation, patrolling, and tactical concealment/ bivouacking. Bivouacking involves establishing temporary field quarters for as little as one or as many as several platoons or companies. Temporary infrastructure for bivouacs consists of vehicle parking, tents, portable latrines, potable water, and gray water holding tanks. Infantry units are permitted to cut and use vegetation less than one (1) inch in diameter as camouflage.

2.4.7 Engineer Units

Engineer units of the Ohio National Guard conduct two types of operations on CRJMTC. First is maneuver operations which are very similar to and covered by the land navigation and convoy operations previously mentioned. There are no departures from the previous descriptions that are unique to engineer maneuver operations.

Next are construction operations which are typically conducted during a two to three week period in the summer months, usually June or July. That varies based on numerous outside considerations. Construction operations include a variety of activities involving both vertical and horizontal construction. The Engineer units do these construction projects as their annual training requirement. Projects are developed jointly with the Camp Ravenna staff and are projects that needed at the training site such as a new parking lot or culvert replacements.

Horizontal construction includes all earthmoving, clearing and grubbing operations relative to construction of roads, parking lots, driveways, and various clearing required prior to vertical construction if needed. Horizontal construction operations have the most potential to harm or destroy bat habitat when they involve the clearing and removal of trees and brush. Most horizontal Engineer projects are condocted on areleady cleared areas such as fields, cantonment areas and parking lots. Any removal of trees three inches DBH or large associated with Engineer training is done outside of the NLEB brood season. If during the course of these training operations bats are found within the project area, the respective activity will stop immediately and the OHARNG will consult with the USFWS regarding the situation.

2.4.8 Other Training and Support

Camp Ravenna also has a simulated collapsed structure and a training area for unit level to large joint agency Homeland Response Forces (HRF) training exercises. The Unit Training and Equipment Site (UTES) has two facilities on Camp Ravenna. The UTES provides maintenance service for all the military vehicles and equipment on post. The Regional Training Institute (RTI) conducts training classes for engineer equipment training, military police, combat engineer, truck driver, carpenters and masons, and a Warrior Leader course at Camp Ravenna. Water purification units and units train on site. Units preparing to deploy also conduct pre-mobilization training at Camp Ravenna.

3.0 LISTED & PROPOSED ENDANGERED SPECIES

3.1 Species List

Camp Ravenna is within the ranges of the below federally listed, proposed-listed, and candidate species.

Common Name	Scientific Name	Federal Status	Habitat within Project Area	Critical Habitat at Camp Ravenna
Indiana bat	*Myotis sodalis*	Endangered	Yes	No
northern long-eared bat	*Myotis septentrionalis*	Proposed Endangered	Yes	No
Mitchell's satyr butterfly	*Neonympha mitchellii mitchellii*	Endangered	No	No
clubshell mussel	*Pleurobema clava*	Endangered	No	No
eastern massasauga (rattle snake)	*Sistrurus catenatus*	Candidate	Yes	No
northern monkshood	*Aconitum noveboracense*	Threatened	No	No

To date there have been no federally listed endangered, threatened, or candidate species or critical habitat documented at Camp Ravenna. The Proposed Endangered Northern Long-

Eared Bat (*Myotis septentrionalis*) will likely become the first federally listed species known to occur on site at Camp Ravenna when it is listed. Despite years of surveys, the Federally Endangered Indiana bat (*Myotis sodalis*), which also utilizes forested habitat in the summer, has not been found on site. There are no winter hibernacula for either the NLEB or the Indiana bat on site and, according to the USFWS, there are none within five miles of Camp Ravenna.

3.2 Northern Long-Eared Bat

3.2.1 Affected Environment

The primary affected environment for the NLEB is the approximately 16,812 acres of forestland but the affected environment really includes the entire 21,683 acres of the Camp Ravenna property. See Section 2.0, Description of Action Area & Action. The entire environment will not be affected at the same time and impacts are generally minor with net positive impacts to wildlife and habitat.

3.2.2 Northern Long-Eared Bat Biology

The NLEB is a medium-sized member of the genus *Myotis* whose range includes the Eastern United States and Canada. They are medium to dark brown and their diagnostic ear length and pointed ear tragus distinguishes them from other local members of the *Myotis* species. The Northern Long-eared bat is a cave dwelling species, it hibernates in the winter and migrates to forested areas in the summer to forage and rear their young. Hibernation generally occurs between September and May. The federally recognized Northern Long-Eared Bat summer roosting season is April 1st to September 30th.

Summer roosting habitat for the Northern Long-eared bat differs for males and females. Males and non-reproductive females roost singly in trees as small as three (3) inches in diameter that have exfoliating bark, cracks or crevices. The NLEB has also been observed roosting in human-made structures such as buildings, barns, under bridges, and bat houses. Tree species is not particular for the NLEB, rather they prefer trees on the interior of large, upland forest tracks. Reproductive females will choose trees with similar characteristics, but choose trees with greater solar exposure where they form small maternity colonies and rear a single pup each year. Pups are born from around late May to early July, depending on the conditions of the year, and become volant (fly) within three to six weeks of birth.

Summer foraging habitat for the NLEB is mainly confined to the interior of the forest where they use echolocation, and unlike other bats in the region, are able to maneuver in a denser understory. Like other bat species, the NLEB is insectivorous and feed by both hawking (catching prey in flight) and gleaning (picking insects from leaves and branches. Their main diet consists of moths, flies, beetles and arachnids. (OHARNG, 2014).

3.2.3 Current Conditions Affecting Northern Long-Eared Bat

The USFWS proposed federal listing of the NLEB in October 2013 because of the major decline in the range-wide population due to white nose syndrome disease. White-nose syndrome

(WNS) is an emergent disease of hibernating bats that has spread from the northeastern to the central United States at an alarming rate. Since the winter of 2007-2008, millions of insect-eating bats in 25 states and five Canadian provinces have died from this devastating disease. The disease is named for the white fungus, *Pseudogymnoascus destructans*, which infects skin of the muzzle, ears, and wings of hibernating bats. In April 2014, WNS was confirmed in Michigan and Wisconsin.

WNS is the most severe and urgent disease facing cave-dwelling bat species today. Without WNS, it is unlikely that populations of NLEB would be declining so dramatically. Since symptoms were first observed in New York in 2006, WNS has spread rapidly throughout the core of the NLEB's range where it was most abundant before the outbreak of this disease. In the Northeastern United States, NLEB populations have declined by 99 percent. Other causes adversely impacting NLEB populations include loss, degradation or disturbance of habitat, as well as mortality from by wind turbines (USFWS, 2013).

Populations of NLEB within Camp Ravenna is not known to yet be impacted by WNS. Since bat surveying began in 1998, there has been a steady increase in the number of bats captured on site. In 1998, five NLEBs were captured, 20 in 2004 and 29 in 2010. See Attached *Ohio Army National Guard Bat Survey Data, 1998-2010* for specific biological information on individual bats captured at Camp Ravenna (Tawse, 1999; Davey Resource Group, 2002; Duffey & Brack, 2005; and Johnson, 2010). There is no shortage of forested habitat at Camp Ravenna. According to the Camp Ravenna Joint Military Training Center Timber Inventory, there is 15,743 acres of pole and sawtimber trees or trees greater than or equal to three-inches in diameter (URS, 2010). This abundance of habitat (roost trees) is evidence that the current condition of the action area (all of Camp Ravenna) is suitable and even preferred by the NLEB.

The cumulative effects of actions, state or otherwise, taking place at Camp Ravenna have been shown to have no adverse effect on Northern Long-Eared Bat populations and seem to be having a net positive affect. As is also stated in Section 3.2.5, NLEB populations have steadily increased since the first base-wide summer bat survey was conducted in 1998. Since this time, actions and activities have drastically increased at Camp Ravenna. Regardless of an increase in training activities, facilities and installation management, and conservation projects, NLEB captures in each of the reoccurring five-year base-wide surveys have yielded more NLEB captures than the previous survey. The last base-wide survey took place in 2010. During that summer survey, a total of 29 NLEBs were captured at Camp Ravenna. In light of these results, it can be concluded that actions taken by or on behalf of the OHARNG at Camp Ravenna have had no adverse effects on the NLEB. The next base-wide survey is scheduled for summer 2015.

The only other biological consultation with the USFWS for a conservation project at Camp Ravenna and its potential impact to the NLEB, pertained to the FY14 timber harvest outlined in the INRMP. The USFWS agreed with the OHARNG in their concurrence letter dated 26 June 2014 that the action may affect, but is not likely to adversely affect the NLEB since tree felling would take place between 1 OCT and 31 MAR.

3.2.4 Critical Habitat

At the present time, there is no federally designated critical habitat at Camp Ravenna.

3.2.5 Effects of Action

In the period from 1998-2010 mist net captures of the NLEB increased during regular, five-year base-wide bat surveys. Five NLEBs were captured in 1998, 20 in 2004 and 29 in 2010. These results seem to indicate that the training and management activities taking place at Camp Ravenna are not negatively impacting the NLEB. Training activity steadily increased during this same 12-year span and natural resources management activities, to include timber management, were ongoing. The action described in this BE is to continue military training, facilities maintenance and natural resources management as has been done in the past with an anticipated slight increase in training activity associated with the development of a few more ranges.

There are no anticipated direct effects on the NLEB resulting from implementation of the outlined actions conducted at Camp Ravenna. Bats will not be taken. Habitat trees will not be cut during brood season and there will be no impact on winter hibernacula. There is an anticipated net positive effect from implementing proactive natural resources management activities. If any of the actions outlined in this BE are found to be adversely affecting the NLEB at Camp Ravenna, the scope of any action deviates from what is already outlined herein, or if new actions that could adversely affect the NLEB commences on site, the OHARNG will consult with the USFWS.

Indirect effects on NLEB could come from habitat lost caused by range or facility construction projects, noise for ranges and equipment, use of smoke obscurants, or noise from the use of pyrotechnics and EID simulators. There is no demonstrated evidence that any of these activities have resulted in adverse impacts on the NLEB in the past. Camp Ravenna is a large post and the training footprint is relatively small and spread out. Even minor losses of forest habitat to construction have not resulted in negative impacts on the NLEB. The forest resources are proactively managed and the forest is maturing and increasing in acreage. Any minor lost in forest acreage would quickly be regained by maturing forest elsewhere on post.

The development of ranges and training venues at Camp Ravenna are by design interrelated and to some extent interdependent. For instance construction of turn pads on tank trails through post is related and interdependent to driving tracked vehicles to the TVMA and to the ranges and construction of barracks is related to training throughput, which is tied to the number of ranges on post. This does not increase or decrease the anticipated effects of the action on the NLEB and the above analysis is still applicable. The size of Camp Ravenna and the ability to utilize existing cantonment areas for development and to space out the habitat loss from range construction within contiguous forest habitat helps minimize impacts to NLEB habitat.

The OHARNG does not anticipate any incidental take of NLEBs at Camp Ravenna due to the fact that we will implement the below listed conservation measures and comply with USFWS guidance regarding NLEB management.

4.0 CONSERVATION MEASURES

All actions conducted at Camp Ravenna are done with forethought and purpose to support the military mission and environmental stewardship. Regardless of the action, the OHARNG strives to ensure that all laws and regulations are being followed in execution of given action(s) and that no species is adversely impacted as a result of a single action or by a given combination of interrelated actions.

4.1 Northern Long-Eared Bat

In general, the OHARNG will follow NLEB management guidelines issued by the USFWS. The following conservation measures will be implemented.

- Continue to conduct base-wide bat surveys every five years in accordance with current USFWS approved survey protocol pending available funding to execute this task.
- Continue to manage the forest at Camp Ravenna as designated in the Camp Ravenna INRMP to retain habitat diversity and long term sustainability of the forest ecosystem. Retain large blocks of mature forest with small openings and adjacent young forest, wetland and grassland habitats. Retain forest connectivity and forested riparian corridors.
- Implement timber marking guidelines contained in the INRMP Section 6.8.5.7. Retain dead, damaged and dying trees that are not a threat to human health and safety and/or the greater forest ecosystem (not an insect or disease outbreak that threatens the entire ecosystem if left unaddressed). Retain adequate roost trees and snags $\geq$ three (3) inches DBH and greater where they exist and encourage/create potential roost trees where their numbers are low (via girdling and creating conditions conducive to regeneration of roost tree species). Retain trees around potential roost trees to maintain the microclimate.
- Avoid felling trees three (3) inches in diameter or greater for timber harvest, TSI, routine maintenance, training activities and construction projects during the bat brood season from 1 April – 30 September
- Where dead, dying or damaged trees pose a threat to human safety or facilities, trees and/or limbs will be removed. The removal will be done outside of the NLEB brood season (1 OCT – 31 MAR) when possible. When not possible, no more than 20 trees will be removed during a single brood season (1 APR – 30 SEP). If any bats are found to be present during a hazard tree/limb removal, the removal will be halted and the USFWS will be consulted.
- Limit forest clearing needed for range and/or facility construction projects to 40 acres or less and conduct the clearing outside of the NLEB brood season. If larger clearings are needed, the USFWS will be consulted.
- Conduct brush cutting operations for vegetation $\geq$ three (3) inches DBH outside of the bat brood season.

- Implement integrated pest management procedures and minimize the use of pesticides in and around potential bat roosting areas.
- Whenever possible, conduct prescribed burns within NLEB roosting habitat outside of the brood season. Burns conducted during the brood season will be low/moderate intensity.
- Avoid conducting construction activities after sunset in known or suitable summer NLEB habitat to avoid harassment of foraging bats.
- Continue implementation of the Camp Ravenna Integrated Contingency Plan to avoid and minimize pollution and to effectively respond and cleanup releases of petroleum and other products.
- Continue implementation of sediment and erosion control best management practice and compliance with Clean Water Act requirements for construction storm water permits and other National Pollution Discharge Elimination (NPDES) permitting.
- Continue implementation of policy to keep fueling and field maintenance facilities located a minimum of 300 feet from surface water-bodies.
- Avoid filling, channelizing, or degrading streams, wetlands and other water areas and obtain appropriate permits when impacts cannot be avoided.
- Construct linear features (power lines, water and sewer lines) in existing rights-of-way and edges of woodlots whenever possible. Use horizontal boring for pipeline crossings of stream corridors whenever possible.
- If bats are using structures designated for demolition, demolition will be conducted after the brood season and after the bats have vacated the structure. If demolition outside of the brood season is not possible and bats are present, a nuisance wildlife specialist will be consulted for humane removal and exclusion of the bats prior to demolition.
- Prior to any construction or demolition activity on bridges, the underside of the bridge will be carefully examined for the presence of bats. If bats are found, the project will be halted and the USFWS contacted.

5.0 CONCLUSIONS

5.1 Northern Long-Eared Bat

Because the OHARNG intends to follow USFWS guidance on Northern Long-Eared Bat management and to implement the above listed conservation measures, the OHARNG has determined that implementation of the actions stated herein will not jeopardize the continued existence of the NLEB while it is Proposed Endangered and **"may affect, but not likely to adversely affect"** the Northern Long-Eared Bat when it becomes listed. There will be no effect to critical habitat at any time because there is no critical habitat at CRJMTC.

5.2 Request of Concurrence

The OHARNG requests that the USFWS review our findings and determinations stated herein and provide a letter of concurrence. If there is anything more we must do to avoid or negate adverse impacts to the NLEB and/or its habitat to ensure USFWS concurrence on this BE, please let us know. We also request any additional information or recommendations on how we can further the conservation of the species.

6.0 LITERATURE CITED

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7.0 CONTACTS & PREPARERS

7.1 Contacts and Consultants

The following individuals were contacted or consulted with for the creation of this Biological Evaluation for the Proposed Endangered Northern Long-Eared Bat at Camp Ravenna:

Ms. Angela Boyer
US Fish & Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Rd., Suite 104
Columbus, Ohio 43130
Phone: (614) 416-8993 x 22
Email: angela_boyer@fws.gov

Ms. Mary Knapp, Ph. D.
US Fish & Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Rd., Suite 104
Columbus, Ohio 43130
Phone: (614) 416-8993
Email: mary_knapp@fws.gov

7.2 Preparers and Co-Authors

The following individuals with the OHARNG at Camp Ravenna were involved in the creation of this Biological Evaluation for the Proposed Endangered Northern Long-Eared Bat:

Mr. Brian P. Riley
Camp Ravenna Joint Military Training Center
Environmental Office
1438 State Route 534 SW
Newton Falls, Ohio 44444
Phone: (614) 336-4564
Email: brian.p.riley17.nfg@mail.mil

Mr. Timothy M. Morgan, C.F.
Camp Ravenna Joint Military Training Center
Environmental Office
1438 State Route 534 SW
Newton Falls, Ohio 44444
Phone: (614) 336-6568
Email: timothy.m.morgan.nfg@mail.mil

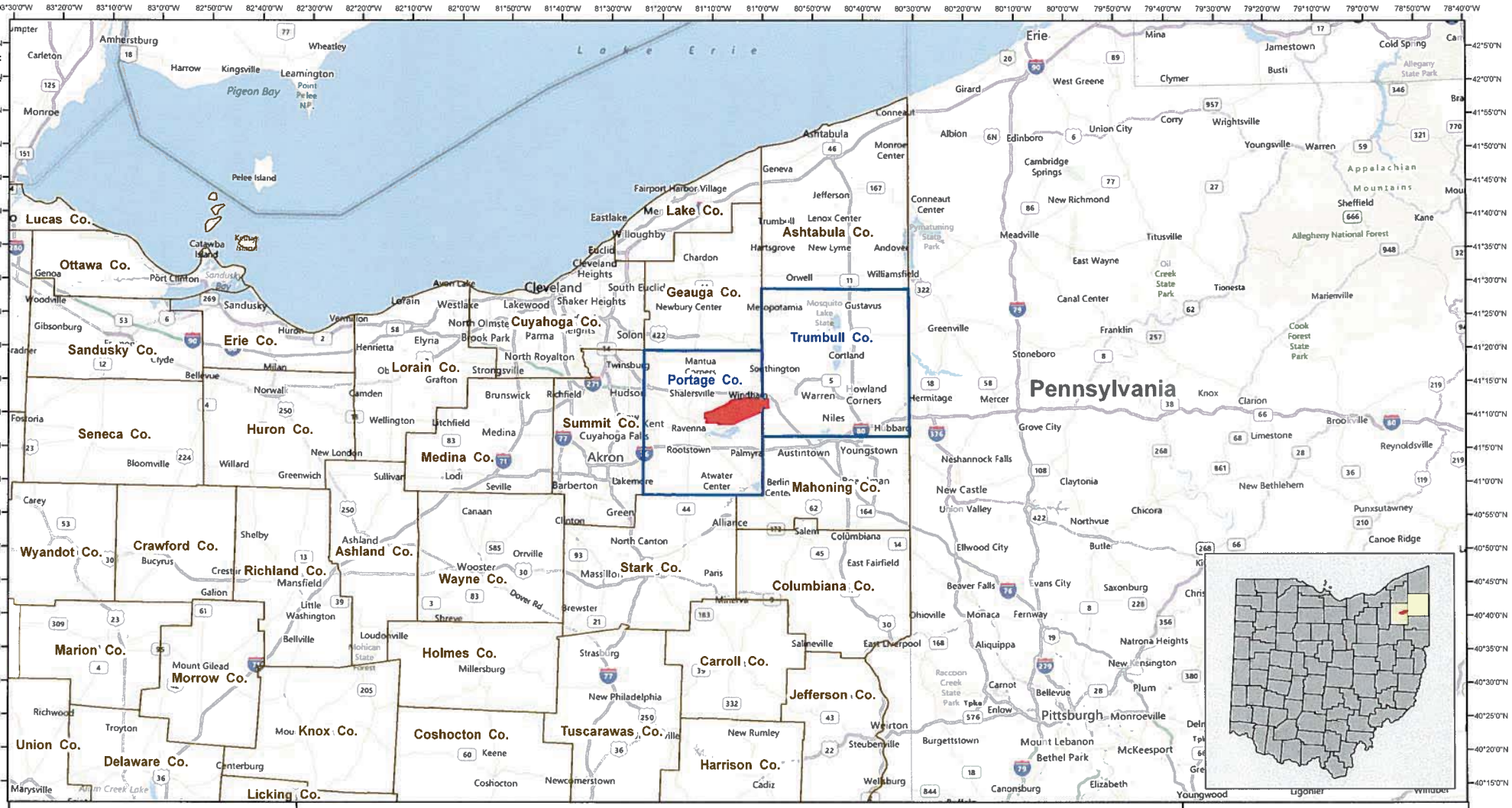
SGM Douglas H. Garloch
Camp Ravenna Joint Military Training Center
8451 State Route 5
Ravenna, Ohio 44266
Phone: (614) 336-6795
Email: douglas.h.garloch.mil@mail.mil

8.0 ACTION AREA MAPS

8.1 Maps and Survey Data

Maps of Camp Ravenna (action area) are attached as appendices to this Biological Evaluation. These maps were finalized in 2014 by EnviroScience, Inc., and are included as Figures within the 2014 Camp Ravenna INRMP. Also attached is the complete Camp Ravenna bat survey summary data from 1998-2010. The following maps and biological data are included within this Biological Evaluation as appendices:

- INRMP Figure 1 – Site Location Map
- INRMP Figure 3 – Installation Map and Facilities
- INRMP Figure 15 – Habitat Management Areas
- INRMP Figure 19 – Timber Harvest History
- Camp Ravenna Bat Survey Data, 1998-2010



20 10 0 20 Miles

20 10 0 20 Kilometers

Figure 1. Site Location Map
Camp Ravenna Joint Military Training Center

No warranty is made by the OHARNG/ARNG as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. This map is a "living document", in that it is intended to change as new data become available and is incorporated into the Enterprise GIS database.

Ohio Army National Guard

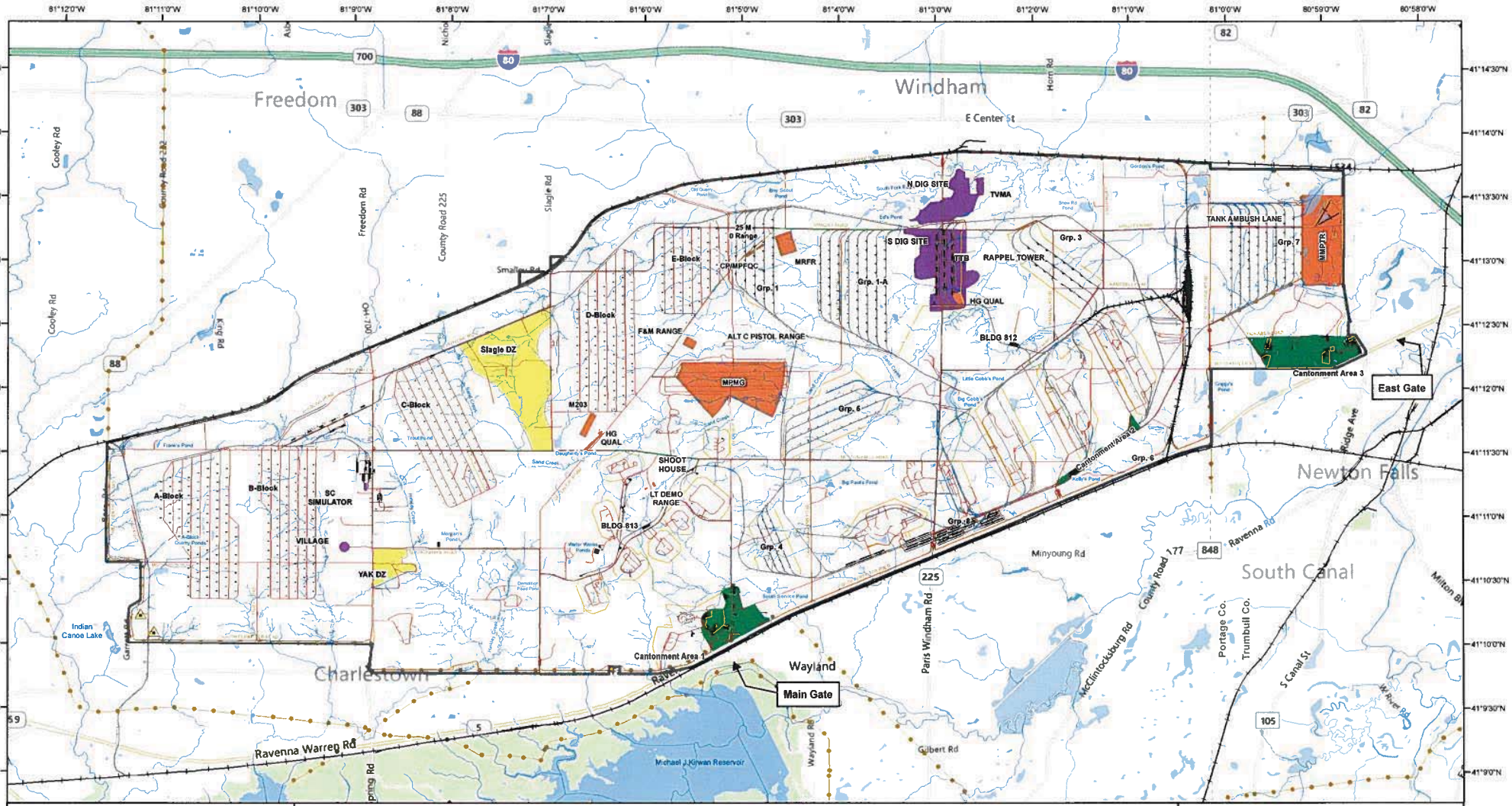
Camp Ravenna Boundary

Portage and Trumbull Counties

Ohio Counties

ARNG Training Center
Garrison Command

Base map courtesy of Bing Maps. Spatial Data courtesy of OHARNG. Projection: WGS84 UTM Zone 17N Date: 8/14/2013



1 0.5 0 1 Mile

1,500 750 0 1,500 Meters

Figure 3. Installation Map and Facilities
Camp Ravenna Joint Military Training Center

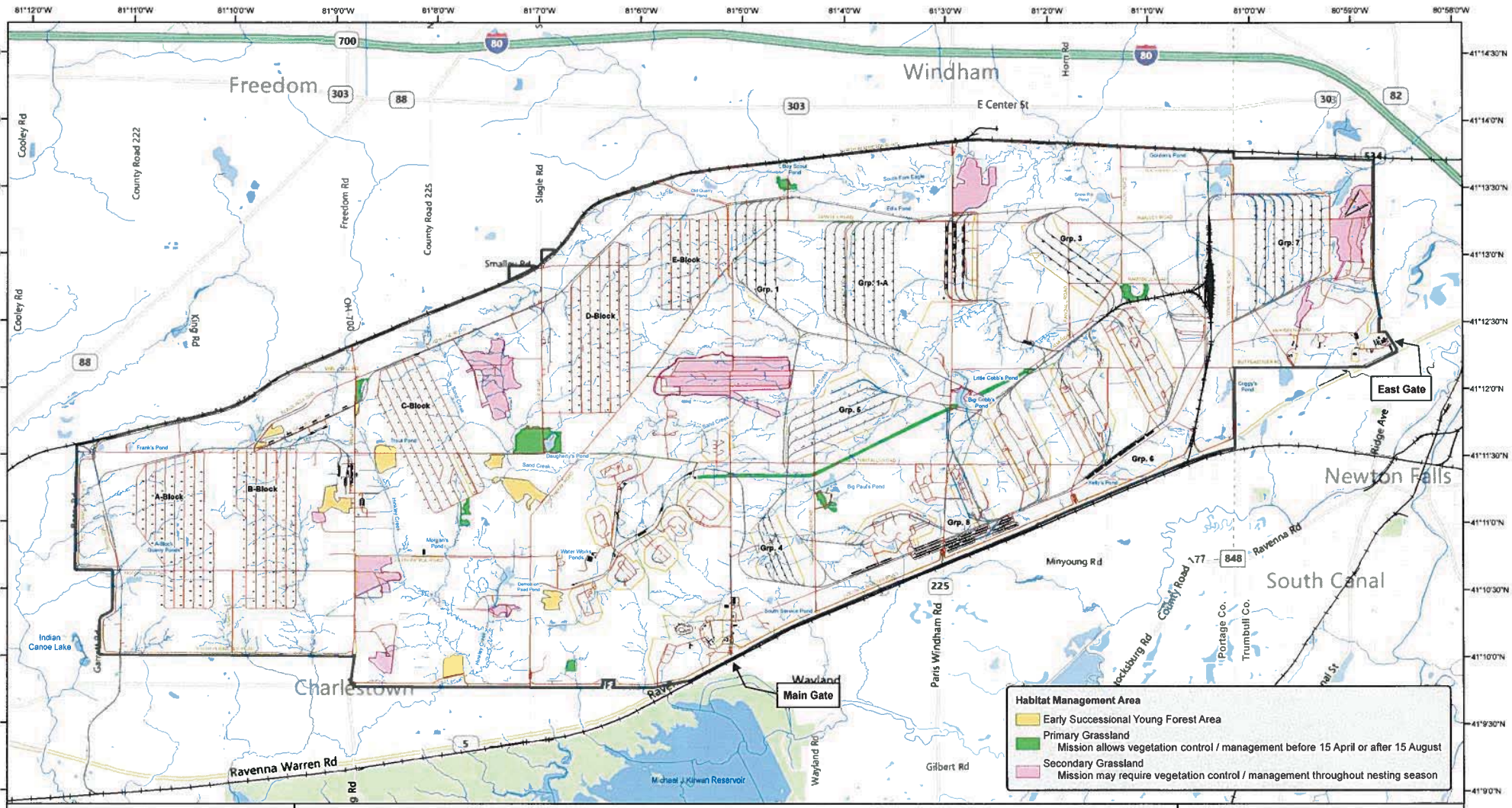
No warranty is made by the OHARNG/ARNG as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. This map is a "living document", in that it is intended to change as new data become available and is incorporated into the Enterprise GIS database.

Oil Well
Above Ground Electrical Line
Fence
Road/Trail
Active Railroad
Inactive Railroad
Pipeline
Creek/Stream
Waterbody
Building
Military Range Area
Cantonment Area
Drop Zone
Training Venue
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013

Ohio Army National Guard

ARNG Training Center
Garrison Command



1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 15. Habitat Management Areas
Camp Ravenna Joint Military Training Center

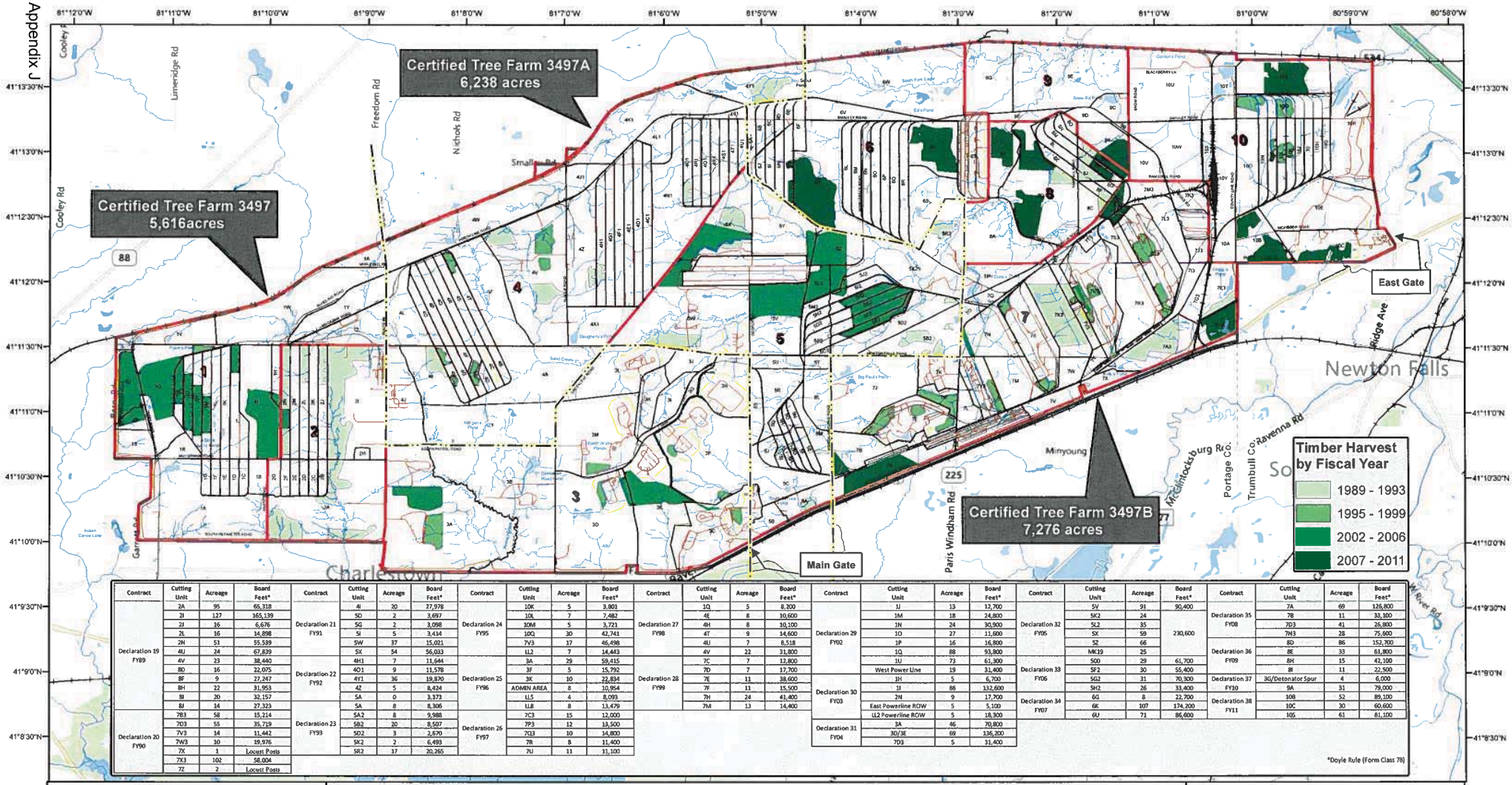
No warranty is made by the OHARNG/ARNG as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. This map is a "living document" in that it is intended to change as new data become available and is incorporated into the Enterprise GIS database.

Above Ground Electrical Line
Fence
Road/Trail
Creek/Stream
Active Railroad
Inactive Railroad
Waterbody
Building
Camp Ravenna Boundary

Ohio Army National Guard

ARNG Training Center
Garrison Command

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/14/2013



Contract	Cutting Unit	Acreage	Board Feet*
Declaration 19 FY89	2A	95	65,318
	2I	127	165,139
	2J	16	6,676
	2L	16	14,898
	2N	53	55,539
	4U	24	67,839
	4V	23	38,440
	8O	16	22,075
	8F	9	27,247
	8H	22	31,953
	8I	20	32,157
	8J	14	27,323
Declaration 20 FY90	7B3	58	15,214
	7D3	55	35,719
	7V3	14	11,442
	7W3	30	19,976
	7Z	1	Locust Posts
	7X3	102	58,004
	7Z	2	Locust Posts

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 21 FY91	4I	20	27,978
	5D	2	3,697
	5G	2	3,098
	5I	5	3,414
	5W	37	15,021
	5X	54	56,033
Declaration 22 FY92	4H1	7	11,644
	4O1	9	11,578
	4Y1	36	19,870
	4Z	5	8,424
	5A	0	3,373
Declaration 23 FY93	5A	8	8,306
	5A2	8	9,988
	5B2	20	8,507
	5D2	3	2,670
	5K2	2	6,493
	5R2	17	20,265

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 24 FY95	10K	5	3,801
	10L	7	7,482
	10M	5	3,721
	10Q	30	42,741
	7V3	17	46,498
	LL2	7	14,443
Declaration 25 FY96	3A	29	59,415
	3F	5	15,792
	3K	10	22,834
	ADMIN AREA	8	10,954
	LL5	4	8,093
	LL8	8	13,479
Declaration 26 FY97	7C3	15	12,000
	7P3	12	13,500
	7Q3	10	14,800
	7R	8	11,400
	7U	11	11,100

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 27 FY98	1Q	5	8,200
	4E	8	10,600
	4H	8	10,100
	4T	9	14,600
	4U	7	8,518
	4V	22	31,800
	7C	7	12,800
	7D	7	17,700
Declaration 28 FY99	7E	11	38,600
	7F	11	15,500
	7H	24	41,400
	7M	13	14,400

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 29 FY02	1J	13	12,700
	1M	18	24,800
	1N	24	30,900
	1O	27	11,600
	1P	16	16,800
	1Q	88	93,800
	1U	73	61,300
	West Power Line	19	31,400
Declaration 30 FY03	1H	5	6,700
	1I	86	132,600
	2N	9	17,700
	East Powerline ROW	5	5,100
	LL2 Powerline ROW	5	18,300
Declaration 31 FY04	3A	46	70,800
	3D/3E	69	136,200
	7D3	5	31,400

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 32 FY05	5V	91	90,400
	5K2	24	230,600
	5L2	35	
	5X	59	
	5Z	66	
	MK19	25	
Declaration 33 FY06	5O0	29	61,700
	5F2	30	55,400
	5G2	31	70,300
Declaration 34 FY07	5H2	26	33,400
	6G	8	22,700
	6K	107	174,200
	6U	71	86,600

Contract	Cutting Unit	Acreage	Board Feet*
Declaration 35 FY08	7A	69	126,800
	7B	11	33,100
	7D3	41	26,800
	7N3	28	75,600
	8D	86	152,700
Declaration 36 FY09	8E	33	61,800
	8H	15	42,100
	8I	11	22,300
Declaration 37 FY10	3G/Detonator Spur	4	6,000
	9A	31	79,000
Declaration 38 FY11	10B	52	89,100
	10C	30	60,600
	10S	61	81,100

*Doyle Rule (Form Class 78)

1 0.5 0 1 Mile

1,400 700 0 1,400 Meters

Figure 19. Timber Harvest History
Camp Ravenna Joint Military Training Center

No warranty is made by the OHARNG/ARNG as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. This map is a "living document", in that it is intended to change as new data become available and is incorporated into the Enterprise GIS database.

Above Ground Electrical Line
Road/Trail
Fence
Active Railroad
Inactive Railroad
Certified Tree Farm Boundary
Creek/Stream
Waterbody
Building
Timber Compartment
Timber Cutting Unit
Camp Ravenna Boundary

Basemap courtesy of Bing Maps. Spatial Data courtesy of OHARNG and USGS. Projection: WGS84 UTM Zone 17N Date: 8/26/2013

Ohio Army National Guard

ARNG Training Center
Garrison Command

Camp Ravenna Bat Survey Data, 1998-2010

(Spreadsheet created 25July2013 by Brian Riley, Natural Resources Manager; 614-336-4564)

BAT SPECIES	OH County	Quantity Captured	M	F	Date Captured	Method	Reference
Eptesicus fuscus (big brown bat)	Portage	27	9	18	8MAY-13SEP1998	Mist Netting	Tawse, 1999
Lasiurus borealis (red bat)	Portage	2	1	1	8MAY-13SEP1998	Mist Netting	"
Lasiurus cinereus (hoary bat)	Portage	1	1	0	8MAY-13SEP1998	Mist Netting	"
Myotis lucifugus (little brown bat)	Portage	42	17	25	8MAY-13SEP1998	Mist Netting	"
***Myotis septentrionalis* (northern long-eared bat)**	**Portage**	**5**	**1**	**4**	**8MAY-13SEP1998**	**Mist Netting**	"
		TOTAL = 77					
Eptesicus fuscus (big brown bat)	Portage	12	5	7	30JUL-1AUG2002	Mist netting	Davey Resource Group, 2002
Lasiurus borealis (red bat)	Portage	7	7	0	30JUL-1AUG2002	Mist netting	"
Myotis lucifugus (little brown bat)	Portage	2	1	1	30JUL-1AUG2002	Mist netting	"
***Myotis septentrionalis* (northern long-eared bat)**	**Portage**	**1**	**0**	**1**	**30JUL-1AUG2002**	**Mist netting**	"
		TOTAL = 22					
Eptesicus fuscus (big brown bat)	Portage	122	-	-	7JUN-10AUG2004	Mist Netting	Duffey *et al* , 2004
Lasiurus borealis (red bat)	Portage	26	-	-	7JUN-10AUG2004	Mist Netting	"
Lasiurus cinereus (hoary bat)	Portage	3	1	2	7JUN-10AUG2004	Mist Netting	"
Myotis lucifugus (little brown bat)	Portage	99	-	-	7JUN-10AUG2004	Mist Netting	"
***Myotis septentrionalis* (northern long-eared bat)**	**Portage**	**20**	**12**	**8**	**7JUN-10AUG2004**	**Mist Netting**	"
Pepistrellus subflavus (tri-colored bat)	Portage	2	0	2	7JUN-10AUG2004	Mist Netting	"
		TOTAL = 272					
Eptesicus fuscus (big brown bat)	Portage	119			9JUL2009-11OCT2010	Mist Netting	Johnson *et al* , 2010
Lasiurus borealis (red bat)	Portage	22			9JUL2009-11OCT2010	Mist Netting	"
Lasiurus cinereus (hoary bat)	Portage	4			9JUL2009-11OCT2010	Mist Netting	"
Myotis lucifugus (little brown bat)	Portage	63			9JUL2009-11OCT2010	Mist Netting	"
***Myotis septentrionalis* (northern long-eared bat)**	**Portage**	**29**			**9JUL2009-11OCT2010**	**Mist Netting**	"
Pepistrellus subflavus (tri-colored bat)	Portage	2			9JUL2009-11OCT2010	Mist Netting	"
		TOTAL = 239					
Eptesicus fuscus (big brown bat)	Portage	36	-	-	4JUN, 24OCT2010	Acustic Monitoring	Johnson *et al* , 2010
Lasiurus borealis (red bat)	Portage	24	-	-	4JUN, 24OCT2010	Acustic Monitoring	"
Lasiurus cinereus (hoary bat)	Portage	1	-	-	4JUN, 24OCT2010	Acustic Monitoring	"
Lasiurus noctivagans (silver haired bat)	Portage	1	-	-	4JUN, 24OCT2010	Acustic Monitoring	"
Myotis lucifugus (little brown bat)	Portage	0	-	-	4JUN, 24OCT2010	Acustic Monitoring	"
***Myotis septentrionalis* (northern long-eared bat)**	**Portage**	**0**	**-**	**-**	**4JUN, 24OCT2010**	**Acustic Monitoring**	"
Nycticeius humeralis (evening bat)	Portage	2	-	-	4JUN, 24OCT2010	Acustic Monitoring	"
Pepistrellus subflavus (tri-colored bat)	Portage	0	-	-	4JUN, 24OCT2010	Acustic Monitoring	"
		TOTAL = 64					

***NOTE: M/F gender not included for some bat species due to escapes from mist net.**

**Camp Ravenna JMTC = 21,683 acres

Camp Ravenna Bat Survey Data, 1998-2010

References

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Tawse, Merrill. 1999. *A Survey of the Bats at the Ravenna Arsenal* . Columbus.

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UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994

May 12, 2015

Brian Riley
OHARNG Natural Resources Manager
Camp Ravenna Joint Military Training Center
1438 State Route 534 SW
Newton Falls, Ohio 44444

TAILS#: 03E15000-2015-I-0542

Dear Mr. Riley,

This is in response to your May 11, 2015 letter regarding the U.S. Fish and Wildlife Service's (Service's) informal conference letter for the Camp Ravenna Joint Military Training Center's (Camp Ravenna's) January 6, 2015 Biological Evaluation evaluating effects of activities at Camp Ravenna on the northern long-eared bat (*Myotis septentrionalis*) (NLEB). The Service issued the conference letter to Camp Ravenna for the NLEB on January 21, 2015. Subsequently, the final rule designating the NLEB as a federally threatened species was published on April 2, 2015 and became effective on May 4, 2015. You have requested that the Service confirm our conference letter as an informal consultation for the NLEB. This response is provided in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

Since issuance of the conference letter, we understand that there have been no significant changes in the action as planned or in the information used during the conference. Therefore, effective May 12, 2015, the Service has officially adopted our conference letter as the consultation letter for the NLEB. The consultation letter serves as a completed informal consultation for the activities described in Camp Ravenna's Biological Evaluation.

This satisfies your requirements under section 7(a)(2) of the ESA for the NLEB for the proposed actions. Should project plans change or if new information reveals that effects of the action may affect the NLEB in a manner not considered in this review, please contact our office for further coordination.

We appreciate your cooperation in working to protect threatened and endangered species. If you have any questions or concerns regarding this consultation, please contact Angela Boyer at (614) 416-8993 ext.22.

Sincerely,

Dan Everson
Field Supervisor

cc: Nathan Reardon, ODOW (email)
Jennifer Norris, ODOW (email)

THE ADJUTANT GENERAL'S DEPARTMENT
CAMP RAVENNA JOINT MILITARTY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444

11 May 2015

Ms. Angela Boyer
US Fish & Wildlife Service
4625 Morse Rd., Suite 104
Columbus, Ohio 43230

Dear Ms. Boyer,

The Ohio Army National Guard (OHARNG) has received your concurrence letter dated 21 January 2015 regarding the Camp Ravenna Northern Long-Eared Bat (NLEB) Biological Evaluation (USFWS TAILS#: 03E15000-2015-IC-0542). Under the authority of the Endangered Species Act, on 2 April 2015, your agency officially listed the NLEB as a Federally Threatened species with a one-year interim 4(d) rule in effect beginning 4 May 2015. The OHARNG understands that because Camp Ravenna is a federally owned facility, we are not subject to the exemptions provided to private individuals and landowners under the 4(d) rule.

In your agency's concurrence letter to us, you agreed with our determination that the proposed activities described in our Biological Evaluation, which are also identified in the approved Camp Ravenna Integrated Natural Resources Management Plan (INRMP), would likely not adversely affect the NLEB which is present at Camp Ravenna. For your convenience, I have attached a copy of this letter.

The OHARNG hereby requests your agency's written acceptance of the Camp Ravenna Biological Evaluation/informal conference, dated 6 January 2015, as formal consultation. Upon receipt of your formal notification of acceptance, the OHARNG will begin implementing our Biological Evaluation as written and regard our informal conference as formal consultation.

If you have any questions concerning this matter, please contact me by phone at 614-336-4564 or by email at brian.p.riley17.nfg@mail.mil.

Sincerely,

Brian P. Riley
Natural Resources Manager
Camp Ravenna Joint Military Training Center

Enclosure

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994

January 21, 2015

Brian Riley
OHARNG Natural Resources Manager
Camp Ravenna Joint Military Training Center
1438 State Route 534 SW
Newton Falls, Ohio 44444

Dear Mr. Riley,

TAILS#: 03E15000-2015-IC-0542

This is in response to your January 6, 2015 Biological Evaluation to evaluate potential impacts of various development, maintenance, training, and conservation practices conducted at Camp Ravenna Joint Military Training Center (Camp Ravenna), on the proposed endangered northern long-eared bat (*Myotis septentrionalis*).

The Biological Evaluation provides an analysis of the following activities at Camp Ravenna:

- Timber harvest and timber stand improvement, including minor forest products and invasive species control
- Other land management activities (grassland, prairie, and brush management)
- Prescribed fire
- Buildings and facilities (demolition, maintenance, construction, and pest control)
- Hazardous tree removal
- Military training and readiness activities

We have reviewed the proposed activities and concur with your determination that the proposed activities are not likely to adversely affect the northern long-eared bat. This concurrence is based on the following conservation measures that will be implemented at Camp Ravenna.

- Forest management to retain habitat diversity and long term sustainability of the forest ecosystem
- Retention of dead, damaged, and dying trees whenever practicable
- Retention of adequate roost trees and snags $\geq$ 3 inches diameter at breast height (dbh)
- Retention of trees around potential roost trees
- Preforming timber harvest and forest clearing between October 1 and March 31
- Removal of hazard trees between October 1 and March 31 whenever practicable
- Removal of no more than 20 hazard trees $\geq$ 3 inches dbh between April 1 and September 30
- Limit forest clearing for range and/or facility construction projects to $\leq$ 40 acres
- Conduct brush cutting for vegetation $\geq$ 3 inches dbh between October 1 and March 31
- Implement integrated pest management procedures and minimize the use of pesticides

in and around potential bat roosting areas
- Conduct prescribed burns in potential roosting habitat outside of the brood season (June 1 – July 31) whenever possible. Burns conducted during the brood season will be of low/moderate intensity
- Avoid construction activities after sunset within potential roosting habitat
- Continued implementation of Camp Ravenna's Integrated Contingency Plan to avoid and minimize pollution and to effectively respond and cleanup releases of petroleum and other products.
- Avoid filling, channelizing, or degrading streams, wetlands, and other water areas and obtaining appropriate permits when impacts cannot be avoided
- Construct linear features in existing rights-of-ways and edges of woodlots whenever possible
- Utilizing horizontal directional boring for pipeline crossing of stream corridors whenever possible
- Avoiding demolition of structures during the brood season (June 1 – July 31) when/if bats are present whenever possible
- Ensure bats are properly removed/excluded from structures prior to demolition
- Examine bridge undersides for bats prior to performing construction or demolition activities and consult with USFWS should bats be present

This concludes voluntary informal conferencing on this action under section 7(a)(2) of the Endangered Species Act. Should, during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, conferencing/consultation with the Service should be reinitiated to assess whether the determinations are still valid.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (ESA), as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy.

If you have questions, or if we may be of further assistance in this matter, please contact Angela Boyer at extension 22 in this office.

Sincerely,

Megan Seymour
Acting Field Supervisor

cc: Nathan Reardon, ODOW (email)
Jennifer Norris, ODOW (email)

APPENDIX K
GLOSSARY

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GLOSSARY

100-year Flood – A flood event of such magnitude that it occurs, on average, every 100 years; this equates to a 1 percent chance of its occurring in a given year.

Aesthetics – Pertaining to the quality of human perception of natural beauty. See *Visual Resources*.

Agriculture - The process of producing food, feed, fiber and other desired products by the cultivation of certain plants and the raising of domesticated animals (livestock). The practice of agriculture is also known as farming.

Air Quality – A measure of the concentrations of pollutants, measured individually, in the air.

Amphibian - Any of a class of vertebrates that regulate their body temperature externally; lay shell-less eggs in wet areas; live in water during early development and live both in water and on land as adults; and use lungs, gills and their skin for breathing.

Aquifer – An underground geological formation containing usable amounts of groundwater that can supply wells and springs.

Aquatic - Living or growing in or on the water.

Archaeology - The discovery, recovery, and study of material evidence or artifacts (ie structures, tools, clothing, implements and burial sites in various states of preservation) of past human life and culture.

Army – One of three military departments (Army, Navy, and Air Force) reporting to the Department of Defense (DoD). The Army is composed of two distinct and equally important components: the active component and the Reserve Component. The Reserve Components are the United States Army Reserve and the Army National Guard. Regardless of component, the Army conducts both operational and institutional missions. The operational Army consists of numbered armies, corps, divisions, brigades, and battalions that conduct full spectrum operations around the world. The institutional Army supports the operational Army. Institutional organizations provide the infrastructure necessary to raise, train, equip, deploy, and ensure the readiness of all Army forces. The training base provides military skills and professional education to every Soldier, as well as to members of sister services and allied forces. It also allows the Army to expand rapidly in time of war. The industrial base provides world-class equipment and logistics for the Army. Army installations provide the power-projection platforms required to deploy land forces promptly to support combatant commanders. Once those forces are deployed, the institutional Army provides the logistics needed to support them.

Army National Guard (ARNG) – A civilian Reserve Component of the Army composed of guardsmen who serve during overseas peacekeeping missions and during local emergencies. The ARNG maintains properly trained and equipped units available for prompt mobilization for war, national emergency, or as otherwise needed.

Army Reserve – A component of the Army, which provides trained and ready soldiers and units with the critical combat service support and combat support capabilities necessary to support national strategy during peacetime, contingencies, and war. The Army Reserve is a key element in the Army multi-component unit force, training with Active and National Guard units to ensure that all three components work as a fully integrated team.

Avian - Of, relating to, or derived from birds.

Barracks – A building or group of buildings used to house military personnel.

Barrier – Any material, structure, or condition that prevents or substantially delays a movement.

Basal Area – A measure of tree density expressed as square feet per acre. It is determined by estimating the cross-sectional area of all trees at 4.5 feet above the ground.

Base Realignment and Closure Office (BRAC-O) – Created by Congress in the late 1980s, the BRAC-O was designed to decide which bases to close in order to reduce the costs of a military no longer focused on the Cold War.

Baseline – Documentation of current conditions so that changes can be identified.

Berm – A mound of earthen material.

Best Management Practices (BMPs) – Methods, measures, or practices to prevent or to reduce the contributions of pollutants. BMPs may be imposed in addition to, or in the absence of, effluent limitations, standards, or prohibitions.

Biodiversity – The variety and abundance of species, their genetic composition, their communities, and the ecosystems and landscapes of which they are a part. As used in this document, biodiversity refers to native biological diversity.

Biological Resources – A feature or component of the natural environment that is of value in serving human needs (e.g., soil, water, plant life, wildlife). Some natural resources have an economic value (e.g., timber), while others have a "noneconomic" value (e.g., scenic beauty).

Biotic – That which pertains to life.

Bivouac – A temporary settlement or shelter consisting of tents, field kitchens, chemical toilets, and showers surrounded by fighting positions.

Board Foot - A unit for measuring wood volume for a tree, a log, or a board. A board foot is commonly 1 foot by 1 foot by 1 inch, but any shape containing 144 cubic inches of wood equals one board foot.

Bog – Wet, spongy land which is usually poorly drained, highly acidic, and rich in plant residue.

Bole – A tree stem once it has grown to substantial thickness, roughly a size capable o yielding sawtimber, veneer logs, or large poles.

Botany - The scientific study of plants.

Browsing - A method of feeding by herbivores, in which the leaves and peripheral shoots are removed from trees and shrubs.

Buffer Zone – An area or strip surrounding another specific area, in part or entirely, to protect the inner area from disturbance by influence from the outside.

Camp Ravenna Joint Military Training Center - (CRJMTC) Formerly Ravenna Training and Logistics Center.

Canopy -The more or less continuous cover of leaves and branches in a forest, usually formed by the crowns of the dominant and codominant trees.

Cantonment Area – Permanent military station, usually contains administration buildings, barracks, and support facilities.

Carrying Capacity - The limit of a natural or man-made system to absorb inputs.

Clay – A mineral soil separate consisting of particles less than 0.002 millimeter in equivalent diameter.

Clean Water Act (CWA) – A comprehensive statute aimed at restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. Enacted originally in 1948, the Act was amended numerous times until it was reorganized and expanded in 1972. It continues to be amended almost every year.

Climate - The meteorological elements, including temperature, precipitation, and wind, that characterize the general conditions of the atmosphere over a period of time at any one place or region of the Earth's surface.

Climax Species - Species capable of perpetuation under the prevailing climate and soil conditions.

Cobble - Rounded rocks ranging in diameter from approximately 64 to 256 mm.

Code of Federal Regulations (CFR) – The CFR is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government. The purpose of the CFR is to present the official and complete text of agency regulations in one organized publication and to provide a comprehensive and convenient reference for all those who may need to know the text of general and permanent Federal regulations. The CFR is keyed to and kept up-to-date by the daily Federal Register.

Community – (1) A group of species of plants and/or animals living and interacting at a particular time and place; and (2) a group of people residing in the same place and under the same government; spatially defined places, such as towns.

Complex – A whole structure composed of interconnected or related structures.

Composition – The numbers and kinds of plants and animals in an area.

Coniferous - Cone-bearing trees having needle or scale-like leaves, usually evergreen and producing wood known commercially as "softwoods."

Contaminants – Any physical, chemical, biological, or radiological substances that have an adverse affect on air, water or soil.

Contiguous - Connecting without a break within a common boundary.

Critical Habitat - A habitat determined to be important to the survival of a threatened or endangered species, to general environmental quality, or for other reasons as designated by the State or Federal government.

Crown – The upper part of a tree, including the branches and foliage.

Cultivated - No longer in the natural state; developed by human care and for human use.

Cultural Resources – The physical evidence of our Nation's heritage, including archaeological sites; historic buildings, structures, and districts; as well as localities with social significance to the human community.

Deciduous – Plants having structures that are shed at regular intervals or at a given stage in development, such as trees that shed their leaves seasonally.

Delineation - The technique of identifying and determining the jurisdictional boundary of wetlands.

Den - The lair or resting-place of a wild animal.

Demographics - The statistics of an area's population such as age, sex, income, education, etc.

Department of the Army (DA) – The executive part of the Department of the Army at the seat of government and all field headquarters, forces, reserve components, installations, activities, and functions under the control or supervision of the Secretary of the Army.

Diameter at Breast Height (DBH) – The width of a plant stem (for example, tree trunk) as measured at 4.5 feet above the ground surface.

Doyle Rule - One of several log rules designed to estimate the lumber yield from logs. The Doyle Rule tends to underestimate the board-foot volume in small logs and overestimate volumes in large logs.

Drainages - A natural system of drains that channel surface water.

Drop Zone - Target area for airtankers, helicopters, and cargo dropping.

Ecoregion - A relatively large unit of land or water that is characterized by a distinctive climate, ecological features and plant and animal communities.

Ecosystem – A community of interacting organisms and their environment that functions together to sustain life.

Edge - Transition zones between grassland and forest.

Egress - A term concerning a right to come and go across the land (public or private) of another

Elliptical - Oval-shaped.

Endangered Species – A plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range.

Endangered Species Act (ESA) – A United States law, passed in 1973. Its purpose is to conserve threatened and endangered animals and plants and the ecosystems on which they depend. Species in need of conservation measures are placed on one of two lists: "endangered," in danger of extinction throughout all or a significant part of its normal range; or "threatened," likely to become an endangered species in the foreseeable future. The law prohibits the killing, shooting, wounding, hunting, capturing, harming, and harassing of a listed species. Court decisions have held that destroying habitat which injures or kills a species is also included.

Entomologist - A scientist that studies insects.

Environmental – (1) In a scientific context, a combination of natural conditions; and (2) in a planning context, a category of analytical studies of aesthetic values, ecological resources, cultural (historical) resources, sociological and economic conditions, etc.

Environmental Assessment (EA) – A publication that provides sufficient evidence and analysis to show whether a proposed system will adversely affect the environment or be environmentally controversial. If the proposed system will adversely affect the environment or be controversial, an EIS is prepared to disclose impacts.

Environmental Impact Statement – As defined in the Council on Environmental Quality regulations, a detailed written report that provides a "full and fair discussion of significant environmental impacts, and (informs) decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment." The draft EIS evaluates a range of reasonable alternatives and their associated impacts and presents a preferred alternative if one option is clearly favored above the others. After departmental review, the draft EIS is circulated among agencies and the public for comment. Following the public hearing held to formally record comments on the draft, a final EIS is prepared incorporating public and agency input and recommending a selected alternative.

Erosion – The wearing away of land surface by wind and water.

Eutrophic - Having high primary productivity; pertaining to waters rich in the mineral nutrients required by green plants.

Exotic Species - A species including its seeds, eggs, spores, or other biological material capable of propagating that species that is not native to that ecosystem.

Facility Maintenance Shops (FMSs) – Facilities that provide storage, support, and equipment maintenance capabilities for the local units during Inactive Duty Training (IDT) events. Often co-located with Readiness Centers.

Farmland – Cropland, pastures, meadows, and planted woodland.

Fen - A marshy, low-lying wetland covered by shallow, usually stagnant, and often alkaline water that originates from groundwater sources.

Fauna – Animal life, especially the animal characteristics of a region, period, or special environment.

Feral - Having become wild from a state of cultivation or domestication.

Fiber - A natural strand that can be spun into thread or yarn or woven into cloth.

Fill Material – Deposited materials such as, rock, soil, asphalt, concrete, construction debris, etc., natural or man-made.

Fiscal Year – A 12-month period to which a jurisdiction's annual budget applies and at the end of which its financial position and the results of its operations are determined.

Fixed-Wing Aircraft – A generic term used in this document to reference the broadest class of aircraft; those in which aerodynamic lift is generated when the airframe including the fixed, or non-rotating, wing is moved through the air by forward thrust from a jet engine or engine driven propeller. Fixed-wing types customarily include fighter, attack, transport, observation, reconnaissance, and trainer aircraft.

Floodplain – The lowlands adjoining inland and coastal waters and relatively flat areas and floodprone areas of offshore islands including, at a minimum, that area inundated by a 1 percent or greater chance flood in any given year. The base floodplain is defined as the 100-year (1.0 percent) floodplain. The critical action floodplain is defined as the 500-year (0.2 percent) floodplain.

Flora – Vegetation; plant life characteristic of a region, period, or special environment.

Forage – All browse and herbaceous food that is available to livestock or game animals, it may be used for grazing or harvested for feeding.

Forb – A herbaceous plant which is not a grass, sedge, or rush.

Forester - A degreed professional trained in forestry and forest management.

Fumigant - A substance which functions or disperses as a gas and as such, can destroy pests and diseases.

Fungicide – A chemical or physical agent that kills or inhibits the growth of fungi.

Game – An animal sought for its ur, feathers, flesh, or trophy value, and which is considered to possess those sporting qualities that enhance the hunt or angling experience.

Gastropod - a class of mollusks typically having a one-piece coiled shell and flattened muscular foot with a head bearing stalked eyes.

Geographic Information System (GIS) – GIS is a computer system that allows environmental analysts to compile, analyze, and model information relevant to proposals that require environmental analysis. It is also a tool that assists decision making by providing a visual depiction of complex data, customized for the situation and circumstances associated with the decision.

Geologic – Of or related to a natural process acting as a dynamic physical force on the Earth (i.e., faulting, erosion, mountain building resulting in rock formations).

Geology – Science that deals with the earth's physical history, the rocks of which it is composed, and its physical changes.

Geology, Topography, and Soils – One of the resource areas analyzed in this EIS for each of the alternatives considered.

Girdle – The act of encircling the trunk of a tree with a continuous series of cuts deep enough to kill the tree over time.

Glacial Till - An unsorted, unstratified mixture of fine and coarse rock debris deposited by a glacier.

Grassland – Land on which the existing plant cover is dominated by grasses.

Groundwater – Water contained in pores or fractures in either the unsaturated zone or saturated zone below ground level.

Habitat – Area in which a plant or animal lives and reproduces.

Hardwoods - A description applied to woods from deciduous broad-leafed trees such as oak, maple, and ash.

Hay – The dried stems and leafy parts of plants cut and harvested by man, such as alfalfa, clovers, other forage legumes and the finer stemmed, leafy grasses.

Hazardous Material – A substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce and that has been designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in part 173 of subchapter C of CFR chapter I (USDOT 2003).

Hazardous Waste – A solid waste (or combination of wastes) that, due to its quantity, concentration, or physical, chemical, or infectious characteristics, can cause or significantly contribute to an increase in mortality. RCRA further defines a hazardous waste as one that can increase serious, irreversible, or incapacitating reversible illness or pose a hazard to human health or the environment when improperly treated, stored, disposed of, or otherwise managed.

Headwater – The source or point of origin of a stream or river.

Heavy Metals - Metallic or semi-metallic elements of high molecular weight, such as mercury, chromium, cadmium, lead, and arsenic, that are toxic to plants and animals at known concentrations.

Hemolytic - Causing the red blood cells to break open.

Heterogeneity – Variability in physical characteristics.

Herbaceous - A plant with soft rather than woody tissues.

Herbicide - A pesticide designed to control or kill plants, weeds, or grasses.

Herbivory - The consumption of plant material.

Hibernacula - A secure area, usually a cave or a den of some sort, used by hibernating animals while in a state of torpor. Most hibernacula are dark and secluded so as to keep the hibernating animal out of harms way from predators or human disturbance.

Historic - The time after information was written down.

Historic Building or Structure – A building or structure, including Goodale's Cutoff, WWII canals, reactors, reactor control panels, WWII concussion walls, and shielded locomotive, that is eligible to the National Register of Historic Places (NHRP).

Holistic - Of or related to a view of the natural environment that encompasses an understanding of the functioning of the complete array of organisms and chemical-physical factors acting in concert rather than the properties of the individual parts.

Hydric Soils - Soils that are wet frequently enough to periodically produce anaerobic conditions, thereby influencing the species composition or growth, or both, of plants on those soils.

Hydrology – 1. The study of water characteristics, especially the movement of water. 2. The study of water, involving aspects of geology, oceanography, and meteorology

Hydrophytic Vegetation – Plants that grow in water or in wet or saturated soils.

Ingress - The right to enter a tract of land. Often used interchangeably with access.

Immunity - A natural or acquired resistance to a specific disease. Immunity may be partial or complete, long lasting or temporary.

Indicator Species - A species whose status provides information on the overall condition of the ecosystem and of other species in that ecosystem. They reflect the quality and changes in environmental conditions as well as aspects of community composition.

Insecticide - A chemical used to kill or control certain populations of insect pests.

Installation – A grouping of facilities, located in the same general vicinity, over which the installation commander has authority (AR 200-1).

Integrated Cultural Resources Management Plan (ICRMP) – A planning document used to integrate a cultural resources program with ongoing mission activities.

Integrated Natural Resources Management Plan (INRMP) – The means by which the Department of Defense (DoD) is fulfilling its responsibility as a steward of public lands while maintaining full support of the military mission. The plans are mandated under the Sikes Act as amended by the Sikes Act Improvement Act (SAIA) of 1997. The Sikes Act requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on lands used for military mission activities. INRMPs are used to implement this program.

Invasive Species – An alien species whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Invertebrate – An animal without an internal skeletal structure.

Kettle - A water filled pit formed by blocks of glacial ice left behind as the glacier retreated.

Landscape - The traits, patterns, and structure of a specific geographic area, including its biological composition, its physical environment, and its anthropogenic or social patterns.

Larva – The immature form of an animal, usually an insect, that must pass through metamorphosis before reaching its adult form.

Leaching – The process by which nutrient chemicals or contaminants are dissolved and carried away by water, or are moved into a lower layer of soil.

Lime - Compounds mostly of calcium carbonates and other alkaline substances used in high rainfall climates to correct soil acidity problems.

Low-Water Stream Crossing - A structure that provides access across a stream during normal flow but is periodically closed due to flooding.

Mammal - A warm-blooded animal with hair that breathes air, has internal fertilization and nurses its live-borne young.

Maneuver – A movement to place ships, aircraft, or land forces in a position of advantage over the enemy.

Maneuver Areas – Range on which employment of live/inert ordnance is prohibited, used for maneuver element training only.

Marsh – A periodically wet, or continually flooded, area where the surface is not deeply submerged.

Mast – Plant fruit, such as acorns, beechnuts, walnuts, and conifer seeds, in a collective sense, especially when used as food by animals.

Mesic - Refers to a habitat that is well-drained but usually moist through most of the growing season.

Moraines - The accumulations of fragments of rock brought down by glaciers.

National Environmental Policy Act (NEPA) (of 1969) – The nation's basic charter for protecting the environment. It establishes policy, sets goals, and provides means for carrying out the policy. In accordance with NEPA, all Federal agencies must prepare a written statement on the environmental impact of a proposed action. NEPA requires all Federal agencies to consider the potential effects of proposed actions on the human and natural environment (AR 200-1). The provisions to ensure that Federal agencies act according to the letter and spirit of NEPA are the Council on Environmental Quality regulations for implementing NEPA (43 CFR 1500-1508).

National Guard Bureau (NGB) – An agency directly related to national security. The U.S. National Guard Bureau (NGB) must ensure that its systems remain operational at all times. The NGB supports mission-critical communications between numerous Army and Air National Guard units across North America. The NGB provides key advice to the United States President and Congress, as well as to the Adjutant Generals of the 54 U.S. states and territories.

National Historic Preservation Act (of 1966) – The nation's central historic preservation law. It establishes the legal and administrative context within which local historic preservation commissions relate to, and participate in, the national historic preservation program. Passed at a time when Americans were becoming increasingly aware of modern development's damaging effects on their heritage, , and strengthened and elaborated upon several times since, the Act is designed to encourage preservation and wise use of our historic resources.

Native American – A member of any of the indigenous peoples of the Western Hemisphere. The ancestors of the Native Americans are generally considered by scientists to have entered the Americas from Asia by way of the Bering Strait sometime during the late glacial epoch.

Native Species – With respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

Neotropical Birds - Adjective used to describe migrating birds that winter in the Neotropics, which includes such areas as southern Mexico, Central America, and most of South America.

Noxious Weeds - Any living stage (including but not limited to, seeds and reproductive parts) of any parasitic or other plant of a kind, or subdivision of a kind, which is of foreign origin, is new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation or the fish and wildlife resources of the United States or the public health.

Oilseed - Any of several seeds that yield oil.

Opportunistic - Taking advantage of the situation or taking advantage of what is available. An opportunistic feeder is one that will eat whenever food is available.

Ordnance – Ammunition for weapons as well as explosives and other similar items.

Ornithology - The study of birds.

Organism - Any living thing.

Outwash - Rocky and sandy surface material deposited by meltwater that flowed from a glacier.

pH – A numerical measure of acidity or hydrogen ion activity. A pH value of 7.0 is neutral; pH values below 7.0 are acid; and pH values above 7.0 are alkaline (basic).

Perennial (Plant) - A species that lives more than three years.

Permeability – In general terms, the capacity of such mediums as rock, sediment, and soil to transmit liquid or gas. Permeability depends on the substance transmitted (e.g., oil, air, water) and on the size and shape of the pores, joints, and fractures in the medium, as well as the manner in which they interconnect. "Hydraulic conductivity" is equivalent to "permeability" in technical discussions relating to groundwater.

Pest - An insect, rodent, nematode, fungus, weed or other form of terrestrial or aquatic plant or animal life that is injurious to health or the environment.

Pesticide – Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest; also applies to herbicides, fungicides, avicides (bird agents), rodenticides, and various other substances used to control pests.

Pheremone - A pheromone is any chemical produced by a living organism that transmits a message to other members of the same species

Physiographic Province – A region in which the landforms are similar in geologic structure and differ significantly from landform patterns in adjacent regions.

Plateau - an area of highland, usually consisting of relatively flat open country uplifted by tectonic activity.

Potable Water – Water that is suitable for drinking.

Predator – An animal that lives by capturing and devouring other animals.

Prime Farmland – Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. See *Unique Farmland*.

Ravenna Training and Logistic Site (RLTS), Ohio – An ARNG installation located in northeastern Ohio within Portage and Trumbull Counties, approximately 3 miles northeast of Ravenna, Ohio. The entire facility consists of approximately 21,683 acres, 20,403 acres of which the NGB is responsible for managing. The mission of the training facilities located at the RTLS is to serve as the primary IDT site in which to enhance the field operational skills of company-sized armor and battalion-sized infantry, combat support, and combat service support units.

Readiness – The state or quality of being ready; preparation; promptness; aptitude; willingness.

Readiness Centers – A military structure where arms and ammunition and other military equipment are stored and training is given in the use of arms. Also known as an Armory.

Reconnaissance – An inspection or exploration of an area, especially one made to gather military information.

Remediation – A long-term action that reduces or eliminates a threat to the environment.

Reptile - A cold-blooded vertebrate that lays eggs and has scales or plates on its skin.

Requisite – Required; essential.

Restoration - The return of an ecosystem or habitat to its original community structure, natural complement of species, and natural functions.

Riffle – The fast flowing sections of a stream where shallow water races over stones and gravel.

Rip Rap – Broken rock, cobbles, or boulders placed on earth surfaces for protection against the action of water.

Riparian Areas – Areas adjacent to rivers and streams that have a high density, diversity, and productivity of plant and animal s A pesticide that is used to kill rats, mice and other rodents.pecies relative to nearby uplands.

Rodenticide - A pesticide that is used to kill rats, mice and other rodents.

Rookery – The breeding place of a group of birds.

Roost – The place, or the support upon which, birds rest, especially at night.

Rotary-Wing Aircraft – Helicopter.

Row Crop – A crop planted in rows, normally to allow cultivation between rows during the growing season.

Rural – A definition used to characterize an area with a substantially modified natural environment. Sights and sounds of humans are readily evident, and the interaction between users is moderate to high. A considerable number of facilities are designed for use by large numbers of people. Facilities for intensified motorized use and parking are available.

Rural - Sparsely settled places away from the influence of large cities and towns.

Sand – A soil particle between 0.05 and 2.0 millimeters in equivalent diameter.

Sandstone - A sedimentary rock consisting of quartz sand united by some cementing material, such as iron oxide or calcium carbonate.

Sanitation Cut - The harvest of dead, damaged, and susceptible trees to prevent the spread of pests and disease within a stand.

Sawtimber – Trees with logs suitable in size and quantity for the production of lumber.

Sediment – Solid materials, both mineral and organic, in suspension or transported by water, gravity, ice, or air; may be moved and deposited away from their original position and eventually will settle to the bottom.

Sedimentation - The process of subsidence and deposition of suspended matter from a wastewater by gravity.

Seep - A spot where water contained in the ground moves slowly to the surface and often forms a pool.

Shale - A fine-grained sedimentary rock formed from mud and silt, commonly gray to black that tends to split into thin layers.

Shrub – A woody perennial plant differing from a tree by its low stature and by its characteristic of generally producing several basal shoots instead of a single bole.

Siltation – The process of depositing silt.

Silvicultural – The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis

Skid Trail - A temporary, nonstructural pathway over forest soil used for dragging felled trees or logs to a log landing.

Slash - Branches and other woody material left on a site after logging.

Soil – The mixture of altered mineral and organic material at the earth's surface that supports plant life.

Soil Amendments - Additives to the soil that provide the capability to retain moisture, improve drainage, provide nutrients and improve the soil texture.

Spatial Data - Data pertaining to the location, shape, and relationship among geographical features.

Special Interest Species - A species that occurs periodically and is capable of breeding in Ohio. It is at the edge of a larger, contiguous range with viable population(s) within the core of its range. These species have no federal endangered or threatened status, are at low breeding densities in the state, and have not been recently released to enhance Ohio's wildlife diversity. With the exception of efforts to conserve occupied areas, minimal management efforts will be directed for these species because it is unlikely to result in significant increases in their populations within the state.

Species of Concern - A species or subspecies, which might become threatened in Ohio under continued or increased stress. Also, a species or subspecies for which there is some concern but for which information is insufficient to permit an adequate status evaluation. This category may contain species designated as a furbearer or game species but whose statewide population is dependent on the quality and/or quantity of habitat and is not adversely impacted by regulated harvest.

State Historic Preservation Officer (SHPO) – An individual responsible for the operation and management of the Office of Historic Preservation, as well as forlong range preservation planning. The Governor appoints the SHPO in consultation with the State Historical Resources Commission and the Director of the Department of Parks and Recreation. The SHPO assists the Commission in accomplishing its goals and duties by developing and administering a program of public information, education, training, and technical assistance. The SHPO also serves as Executive Secretary to the Commission and is responsible for developing an administrative framework for the Commission, as well as for implementing the Commission's preservation programs and priorities.

Stakeholder – A person, jurisdiction, organization, or agency with an interest in a particular project.

Stewardship - The concept of responsible caretaking; based on the premise that we do not own resources, but are managers and are responsible to future generations for their condition.

Succession – The progressive development of vegetation toward its highest ecological expression, the climax.

Surface Waters - All water occurring above ground. This includes wetlands, lakes, rivers, and streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or ponds.

Swale - An elongated depression in the land surface that is at least seasonally wet, is usually heavily vegetated, and is normally without flowing water.

Swamp – An area saturated with water throughout much of the year, but with the surface of the soil usually not deeply submerged, it is usually characterized by tree or shrub vegetation.

Take - To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, root up, cut, sever, or to attempt to engage in any such conduct upon an animal or plant. A term used with discussions on endangered and threatened animal or plant species.

Tamarack - An American larch tree usually found in swamps.

Terrain – (1) A particular geographic area; a region; and (2) a piece of ground having specific characteristics or military potential.

Terrestrial Communities – Groups of cover types with similar moisture and temperature regimes, elevational gradients, structures, and use by vertebrate wildlife species.

Threatened Species - A species or subspecies whose survival in Ohio is not in immediate jeopardy, but to which a threat exists. Continued or increased stress will result in its becoming endangered.

Topography – Physical features of the ground surface, such as hills, plains, mountains, steepness of slope, and other features.

Topsoil - The surface layer of soil containing partly decomposed organic debris, which is usually high in nutrients, contains many seeds, and is rich in mycorrhizae.

Troop – A collective term for uniformed military personnel.

U.S. Property & Fiscal Office (USP&FO) – The primary point of contact for matters relating to Federal funds and property. The USPFO ensures that Federal funds are obligated and expended in conformance with applicable statutes and regulations and makes returns and reports on Federal funds and property. The USPFO provides financial management, property accountability, Federal contracting, and internal review. The USPFO also authenticates requirements and authorizes expenditures of Federal funds for equipment, supplies, services, and payroll in accordance with approved budget authorizations.

Unique Farmland – Land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits, and vegetables.

Understory - The layer formed by the leaves and branches of the smaller trees under the forest canopy.

Upland – The land that is at a higher elevation than the alluvial plain or stream terrace.

Urban Area – An area comprising all territory, population, and housing units in urbanized areas, or places of 2,500 or more persons outside of urbanized areas. An urbanized area comprises one or more places (central place) and the adjacent densely settled surrounding territory (urban fringe) that together have a minimum of 50,000 persons.

Vascular Plants - Plants with a well-developed vascular system that transports water, minerals, sugars, and other nutrients throughout the plant body. Excludes the bryophytes: mosses, hornworts, and liverworts.

Vernal Pool - A pool of water forming in the spring, usually dry part of the year.

Vigor - Overall health; the capacity to grow and resist physiological stress.

Visual Resources – Visual resources are defined as the natural and man-made features that comprise the aesthetic qualities of an area. Also, see *Aesthetics*.

Water Resources – The supply of groundwater and surface water in a given area.

Waterfowl – Collectively, all species of ducks, geese, and swan.

Watershed – The region draining into a river, river system, or other body of water.

Wetlands – Areas that are regularly saturated by surface or groundwater and are therefore characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions. Examples include swamps, bogs, fens, marshes, and estuaries.

Wildlife – Undomesticated animals considered collectively.

Wildlife Habitat - The set of living communities in which a wildlife population lives.

Woodland – Any land used primarily for growing trees and shrubs.

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